



*High performance. Delivered.*

## **Global Alliance for Clean Cookstoves**

Mexico Market Assessment

*Sector Mapping*



# Introduction

- This Market Assessment was conducted by Accenture Development Partnerships (ADP), the not-for-profit arm of the global management consultancy, Accenture, on behalf of the Global Alliance for Clean Cookstoves (the Alliance).
- It is intended to provide a high level snapshot of the sector that can then be used in conjunction with a number of research papers, consumer surveys and other sources (most published on the Alliance's website) to enhance sector market understanding and help the Alliance decide which countries and regions to prioritize.
- It is one of sixteen such assessments completed by the Alliance to:
  - Enhance sector market intelligence and knowledge.; and
  - Contribute to a process leading to the Alliance deciding which regions/countries it will prioritize.
- Full slate of market assessments include studies in: Bangladesh, Brazil, Colombia, East Timor, Ethiopia, Ghana, Indonesia, Kenya, Mexico, Nigeria, Peru, Rwanda, South Africa, Tanzania, Uganda and Vietnam.
- Each assessment has two parts:
  - Sector Mapping – an objective mapping of the sector.
  - Intervention Options – suggestions for removing the many barriers that currently prevent the creation of a thriving market for clean cooking solutions.
- In each Alliance study a combination of ADP and local consultants spent 4-6 weeks in country conducting a combination of primary (in-depth interviews) and secondary research. They used the same Market Assessment 'Toolkit' for each country so that comparisons can be made. The Toolkit is available free of charge to all organizations wishing to use it in other countries.
- **The Alliance wishes to acknowledge the generous support of the following donors for the market assessments: Barr Foundation, Dow Corning Corporation, Shell Corporation, Shell Foundation, and the governments of Canada, Finland, and Spain.**

*This market assessment was produced by Accenture Development Partnerships (ADP) on behalf of the Alliance. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of the Global Alliance for Clean Cookstoves or its partners. The Alliance does not guarantee the accuracy of the data.*

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# Sector Mapping (1/2)

Mexico, a 113 million person middle-income emerging market with an abundant supply of natural resources and a number of strong industries, has positioned itself as a regional power. However, a significant part of the population (22%) has not received the benefits of the country's recent economic growth and still lives in high and very high levels of marginality, mostly in rural areas. It is estimated that over six million households use firewood as primary or secondary fuel source to cook, and are affected by indoor air pollution.

Historically the government lacked data to understand the magnitude and complexity of the problem, but in recent years, very detailed information has been compiled, and multiple programs have been launched to address poverty and indoor air pollution. However, the main driver for the government's cookstove dissemination programs targeting 600,000 families by 2012 has been environmental as part of a national commitment to reduce GHG emissions by 50% between 2000 and 2050.

Addressing the Mexican market is challenging because of the country's large geography and extreme dispersal of the communities, including almost five million people living in rural communities without access to roads. In addition, the diversity of the population and their traditions - especially those of the more than six million indigenous communities whose mother tongue is not Spanish - not only requires adaptations of the cookstoves, but also of the programs and their approach.

Although the existence of a large number of prior cookstove projects and market players in Mexico is encouraging, more coordinated efforts could help address existing gaps in the cookstove value chain, such as awareness raising, cookstove certification, distribution, monitoring and maintenance. This coordination of efforts - maybe through an independent organization - could help address the lack of long term vision that some programs have had, partially due to government changes every six years.

# Sector Mapping (2/2)

	Findings
<i>Social and Environmental Impact</i>	<ul style="list-style-type: none"> <li>• Top government priorities such as eliminating extreme poverty, and reducing deforestation and carbon emissions have been the major drivers for cookstove programs in Mexico in recent years</li> <li>• Due to the country's recent economic growth, funding has not been a limiting factor for cookstove programs and most improved cookstoves distributed have been fully subsidized</li> </ul>
<i>Consumers</i>	<ul style="list-style-type: none"> <li>• Households living in marginal or very marginal conditions in small communities -mostly in rural areas- are the main consumers of fire wood for cooking, including 95% of indigenous communities. Even when electricity and gas are available, these communities cannot afford it, so improved biomass stoves are the only alternative for them</li> <li>• Mexican cooking habits require that any stove solution has at minimum an iron skillet (called "comal"), but a single stove solution is not possible since the diversity of cooking traditions due to large ethnic, climate and topology differences requires stove adaptations by region</li> </ul>
<i>Cookstove Industry</i>	<ul style="list-style-type: none"> <li>• Although many organizations have pursued improved cookstoves initiatives in Mexico and several models have been developed and installed across the country, in total they have only addressed about 10% of the potential market, so there is an opportunity to coordinate efforts to address the remaining 90% in a quicker more efficient way -this includes the need for an official standards, testing and accreditation organization for stove designs, stove manufacturers and stove builders</li> </ul>
<i>Carbon Financing</i>	<ul style="list-style-type: none"> <li>• While there are three carbon cookstove programs in progress both in the CDM and voluntary market pending registration or validation for 2012, all focused on the long-term use of the stoves, coordination between the government and carbon credit developers will be critical to the further development of this high potential carbon market to avoid falling under the "additionality" rule in future programs</li> </ul>

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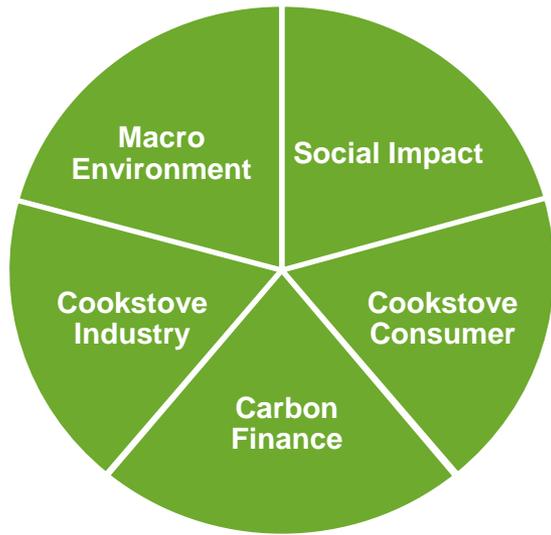
**Sector Mapping Summary**

**Appendix**

# Project Approach

A structured approach first assessed the market for a cookstove industry and then used the Sector Mapping output to develop the Intervention Options and Relative Roadmap

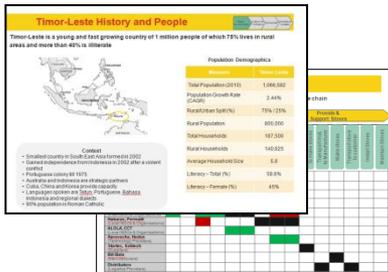
## Sector Mapping



## Strategy Development



## Intervention Options And Relative Roadmap



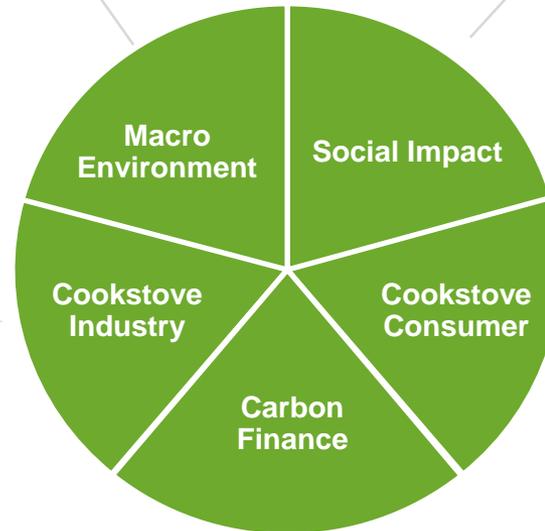
Sector Map

# Sector Mapping Approach

## Sector Mapping of the cookstove sector was conducted across five dimensions:

- *Social:* What is the country demographics & population distribution across regions?
- *Political:* How stable is government & what political risks will any program face?
- *Economic:* How much money do our potential customers have & what is the economic cycle?
- *Technological:* How sophisticated is the infrastructure & what is the plan for progress?
- *Environmental:* How do ecological conditions impact the success of cookstove programmes?
- *Gender:* How does gender play a role in clean cookstove use and purchase?

- What cooking devices are currently used within the region?
- Who are the main players active in the cookstove sector?
- What are the opportunities / threats for current & future cookstove programmes?
- How commercially attractive is the sector & what are likely to be some of the industry challenges?



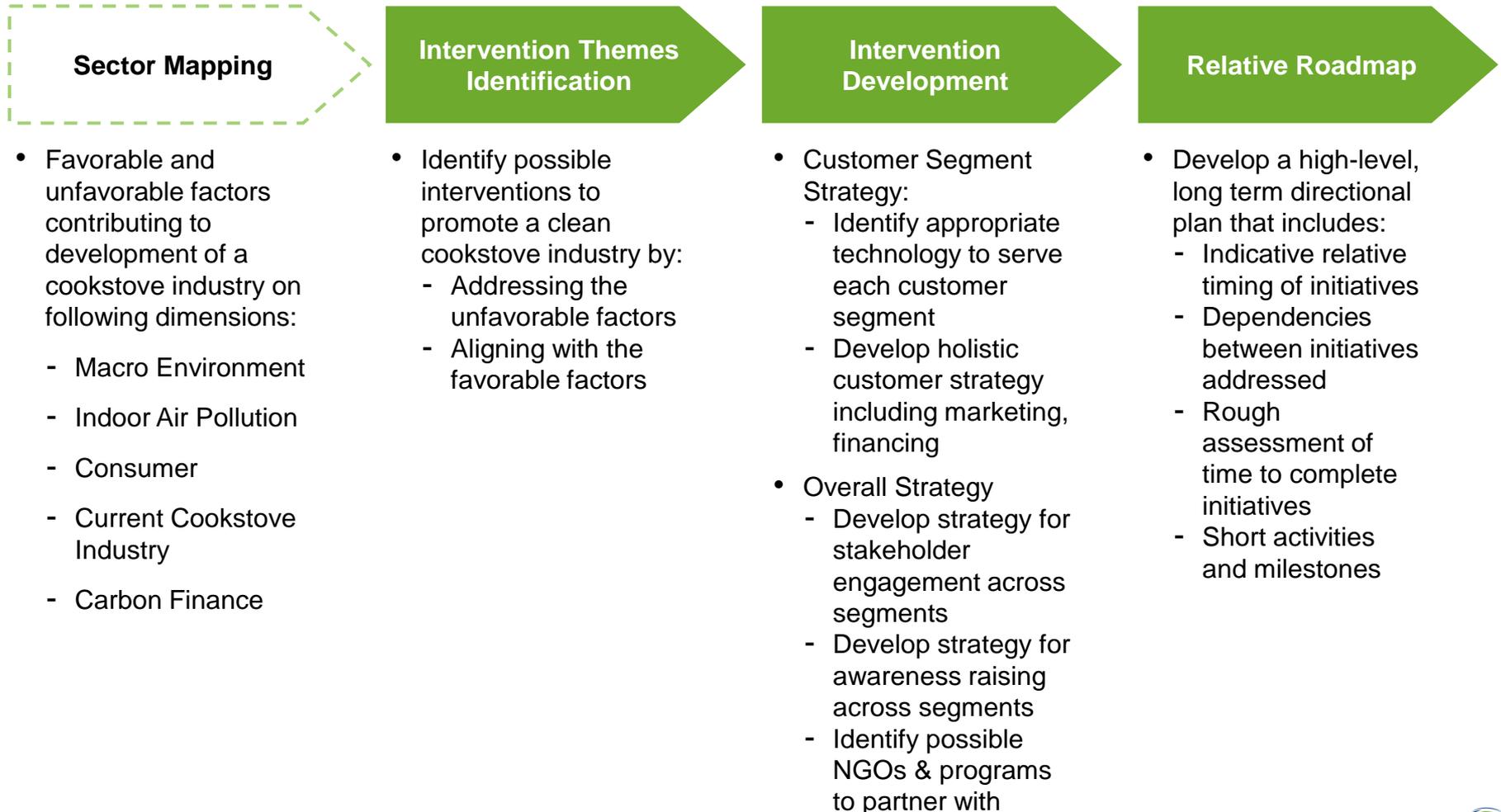
- What carbon financing options exist for the country?
- What structures exist which can be leveraged for future carbon financing components?
- Which entities are likely to fill the required roles in the carbon finance operating model?

- How do people cook and what fuels are used in the region?
- What is the current IAP exposure profile of our target market? (Primary cause of IAP and size of problem)
- What are the other impacts caused by the use of poor cooking stoves?
- How does the impact of cookstoves stack up against other health & social priorities?

- What is the profile of the target population?
- How can the customer population be segmented / categorized?
- How big is each customer segment and what are its characteristics?
- What are the specific needs of each customer segment?

# Intervention Options Approach

Intervention development was conducted by using sector mapping as input to identify intervention areas, develop recommendations and develop a high level operational plan



# Acknowledgements

Many organizations made valuable contributions to this study with their knowledge of Mexico or experience in cookstove initiatives.



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# Social Environment

Mexico is the 11<sup>th</sup> most populous country in the world, with 113 million people. 22% live in 'rural' areas and more than 18% live below the poverty line.



## Context

- Before the Spanish arrival in 1519, Mexico was occupied by a large number of Indian groups with very different social and economic systems.
- Along with other Spanish colonies in the New World, Mexico fought for and gained its independence in the early 1800s.
- The continent-wide North American Free Trade Agreement (NAFTA) went into effect in 1994.
- Official languages include Spanish and indigenous languages.

## Population Demographics

Measure	Mexico
Total Population (2010)	113 M
Population Growth Rate (CAGR)	1.2%
Rural/Urban Split (%)	22% / 78%
'Rural' Population	25 M
Total Households	28 M
'Rural' Households	6 M
Average Household Size	3.9
Literacy – Total (%)	93%
Literacy – Female (%)	91%
Life Expectancy (years)	76
Population below poverty line	18%

## - Implications -

***Cookstove interventions in Mexico will differ across economic and geographic regions.***

The country has been governed by the National Action Party since 2006; upcoming elections in July 2012 may bring significant change.



## Administrative Map

- Capital is Mexico City (Distrito Federal)
- Country is divided into 31 states and the Federal District, which is further separated into 2456 municipalities
- Mexico City, Ecatepec, Guadalajara and Puebla are the most populated urban areas

## Political Environment

### Structure

- Federal Republic
- Presidents are directly elected by simple majority of registered voters in 31 states and the Federal District.
- The president holds the formal titles of chief of state, head of government, and commander in chief of the armed forces.

### Current Government

- Felipe Calderon from the National Action Party (PAN) was elected in 2006, beating out Democratic Revolution Party candidate Andrés Manuel López Obrador.
- The next election is scheduled for July 2012

### Working with the Government

- The current government has stated that creating jobs, reducing poverty and fighting drug cartels are the top three priorities.

### - Implications -

***A cookstove program that aligns with the government's priorities of jobs, poverty and drug cartels is essential for political support.***

# Economic Environment

Mexico is an upper middle-income, emerging market with an abundant supply of natural resources, a number of strong industries and modern infrastructure positioning itself as a region power.

## Country Economics

Key Indicators	
GDP (2010)	\$1.0348 trillion USD
GDP Per Capita (2010)	\$9,123 (USD)
Economic Growth Rate (2010 est.)	5.5%
Inflation Rate (2010)	4.2%
Unemployment	5.4%
Youth Unemployment (2009)	10%

Key Indicators	
Exports	US\$303 billion: manufactured goods, oil and oil products, silver, fruits, vegetables, coffee and cotton <i>Major markets:</i> US, Canada, Germany
Imports	US\$306 billion: metalworking machines, steel mill products, agricultural machinery, electrical equipment, car parts for assembly, repair parts for motor vehicles, aircraft and aircraft parts <i>Major suppliers:</i> US, China, Japan, S. Korea, Germany
GDP composition (2010):	Agriculture 3.9% Industry 32.6% Services 63.5%

### - Implications -

***The country is in need of employment generating activities; any program that stimulates employment –especially for youth- will be much more receptive to the government and local population.***

Although women education levels have surpassed those of men within young generations, there are still large inequalities in labor force participation and government representation.

## Policy<sup>5</sup>

- The order of priority of gender issues for the government is:
  1. Domestic violence and women murders – 67% of women over 15 have been victims of violence <sup>1</sup>
  2. Maternal mortality – 85 deaths per 100,000 births <sup>2</sup>
  3. Women trafficking - up to 20,000 children are victimized in commercial sexual exploitation in Mexico every year <sup>3</sup>
  4. Climate change - which contemplates the stoves
  5. Education - which is lower priority now as goals have been reached with young generations

## Cultural Background

- Women are the head of 25% of households, and men of 75%<sup>4</sup>
- The number of women per 100 men ranges from 104 within the younger than 29 -mainly due to men migration- to 115 within the older than 60, but this is mainly due to greater survival of women <sup>4</sup>
- Although 83% of the country is catholic, polygamy exists in some communities

## Gender Equality Statistics <sup>4</sup>

	Male	Female
Primary school attendance	96.2%	96.5%
Secondary school attendance	66.1%	68%
Remunerated labor force participation	70%	35%
Literacy of population over 15	93.7%	91.1%
Literacy of population 8 to 14	94.9%	95.9%
Representation in federal government	81.6%	18.4%
Municipal government leadership	94.6%	5.4%

## - Implications -

**Cookstove programs must focus on raising awareness among both men and women in the communities, as well municipal leaders, which are mostly men.**

The country faces challenges in non-communicable diseases and technology infrastructure; the country is rich in natural resources, especially petroleum.

Current Situation

## Health

- Growth of noncommunicable diseases, accident rates and unhealthy lifestyle behaviours
- Diabetes is the leading cause of death in women and the second in men

## Infrastructure

- 35% of all roads are paved
- 31% internet users
- 81% mobile phone users

## Energy

- 98% of population have access to electricity
- 5% of energy supplied by two nuclear reactors

## Natural Resources

- Holds petroleum, silver, copper, gold, lead, zinc, natural gas, timber
- 6<sup>th</sup> largest producer of petroleum in the world
- Mexico's natural gas consumption is rising primarily due to greater use of the fuel in power generation

Government Priorities

- Equity in health
- Risk reduction and health promotion
- Surveillance, prevention and control of diseases
- Quality of services and health system performance

- Federal programs included those pertaining to sustainability and food safety, as well as several projects relating to increased use of technology.

- In coming years Mexico will increasingly rely on natural gas

- Heavy government investment in natural gas

### - Implications -

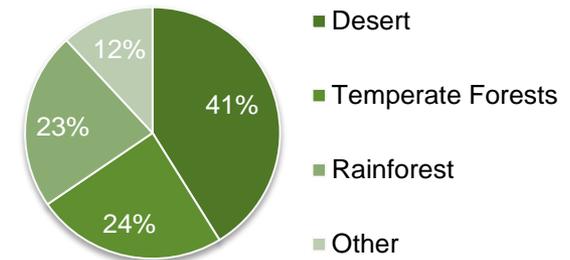
***Strong natural resource interests may dominate the government's focus and dictate energy policy.***

41% of Mexico is desert, and although deforestation rates have been reduced in recent years, it is still a concern for the government.

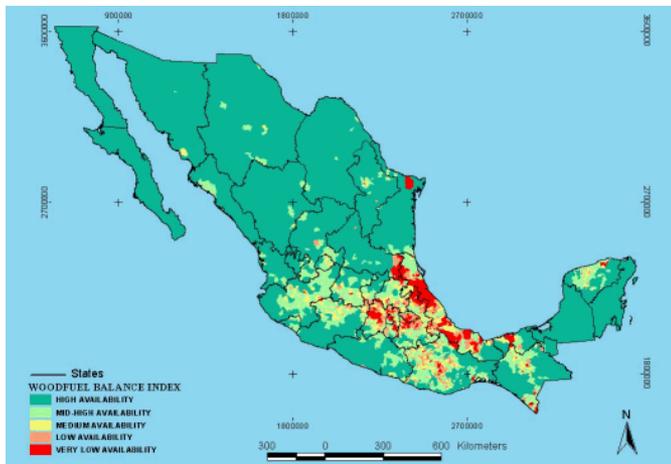
## Climate

- Mexico's climate varies from tropical to desert -the Tropic of Cancer divides the country into temperate and tropical zones. The north is cooler in winter, while the south has fairly constant temperatures year round which vary solely as a function of elevation
- There are pronounced wet and dry seasons in most of the country and both coasts are susceptible to hurricanes June to November

In Mexico today there are 138million hectares of forests



## Fuel wood supply/demand balance 2000



## Deforestation

- As a result of the environmental policy of the Federal and State governments the annual loss of wood was reduced from 350,000 hectares in 1990 to 155,000 hectares in 2011
- Even if deforestation rates have been reduced, deforestation is still seen as a national problem and the government is still focused on deforestation reduction
- Access to firewood is not generally a problem for the rural communities
- Mexican law allows the use of wood for domestic use but volume limits to determine domestic wood are not set – punishment only when more than 5 cubic meters of firewood is being transported

## - Implications -

**Improved cookstove programs that address firewood consumption reduction are already in the government's agenda as part of a larger deforestation reduction objective.**

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# Cooking Habits

**Mexican food varies by region, and is influenced by the local climate, geography and ethnic differences. While urban households generally use gas to cook, a large proportion of rural homes use wood fires.**

## Type of Food



- **Tortillas** are the staple food across the county with variations in ingredients, size and cooking method
- **Slow cooking food like beans and stews**, as well as steamed tamales are also traditional in all regions
- Although rice is consumed in Mexico, it is more of a “special meal” and not regularly part of the diet of low income communities

## Cooking Habits



- Tortilla cooking requires the use of iron skillets (“comales”) while bean preparation requires big pots –both things are sometimes done at the same time
- Tortillas are prepared and re-heated at the time of eating –the different types of tortillas require adaptations to the iron skillets (e.g. in size)
- Ethnic differences dictate cooking traditions, which vary greatly across regions
- Wood fire is the main fuel used by at least 14% of the total households, and 38% of very high marginality households<sup>1</sup>
- Beans and tortillas require a lot of wood to cook
- Food smoking is traditional in some areas (e.g. Yucatan peninsula)
- Gas and electricity stoves are prevalent in urban areas except within very poor homes
- Street food vendors are very common across the country

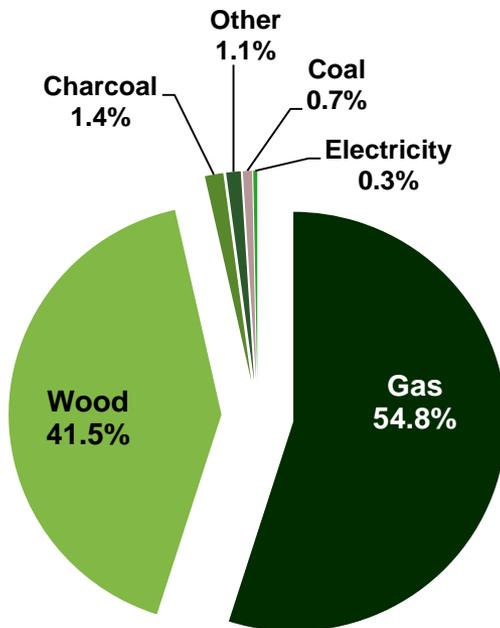
## – Implications –

***Substitution of open fire must compensate for the wide range of traditions of the different ethnic groups across the country. Multiple stove designs might be needed.***

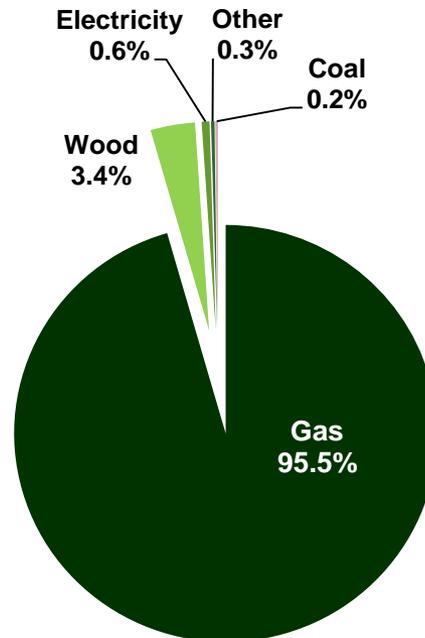
# Fuel Usage & Availability

In urban Mexico gas (LPG and natural) is the dominant household fuel (96%), but in rural areas fuel use is more evenly split (44% biomass and 55% gas).

Total Rural Fuel Use<sup>1</sup>



Total Urban Fuel Use<sup>1</sup>



Fuel use & availability

- LPG is the main household fuel in Mexico, used by 71% of the total population<sup>2</sup>
  - 53% of LPG is distributed through portable containers & 47% through networks & bulk tanks. Supply through bulk tanks has been increasing<sup>2</sup>
- Natural gas is only sold to 7% of the population, mostly in the northeast<sup>2</sup>
- In rural areas not serviced by LPG or natural gas, wood fuels are used by almost 43% of the households<sup>1</sup>
- Fuel wood markets are largely restricted to the local level (villages and micro regions)<sup>3</sup>
- Electricity is not significantly used for cooking in Mexico –in rural areas it is available to over 95% of the households but only 0.3% uses it to cook<sup>4</sup>

## - Implications -

**Given the heavy reliance on wood fuels in rural areas, any successful intervention must either use stoves that are able to cook on wood or provide the fuel as a part of the intervention. LPG would be the only alternative for wood users to date.**

# Available Fuel Cost

Availability and price are the main drivers of fuel usage. LPG -the main fuel in urban areas- is both expensive and unavailable in many rural communities.

## Observations

- Household fuel wood use patterns vary significantly by region and income level <sup>7</sup>
- LPG use increases with income, but less so for indigenous households<sup>3</sup>
- LPG cost has been continuously increasing in the last decade <sup>6</sup>
- The government subsidizes electricity, gasoline, diesel and LPG <sup>2</sup>. Due to severe criticism, in 2012 a gradual removal of electricity subsidies was announced, but this will not affect 75% of the population that uses under 140kWh per month

Fuel	Unit of purchase	Cost Per Unit (MXN) <sup>5</sup>	Monthly Per Capita Consumption <sup>1,4</sup>	Monthly Per Capita Cost (MXN)
Wood	1kg	2.21	50kg	111
Electricity *	Kw/Hr	1.06	133Kw/H	141
Natural Gas	1m3	5.32	49m3	261
LPG	1 kg	8.82	30kg	265

## Average Monthly Cost (in USD)



Energy subsidies are inefficient as a poverty-alleviation mechanism, as a large part is captured by higher-income groups. Moreover, energy subsidies create incentives to consume more energy and invest less in energy efficiency, reducing energy security and raising greenhouse gas (GHG) emissions.

-OECD Economic Survey Mexico 2011

## - Implications -

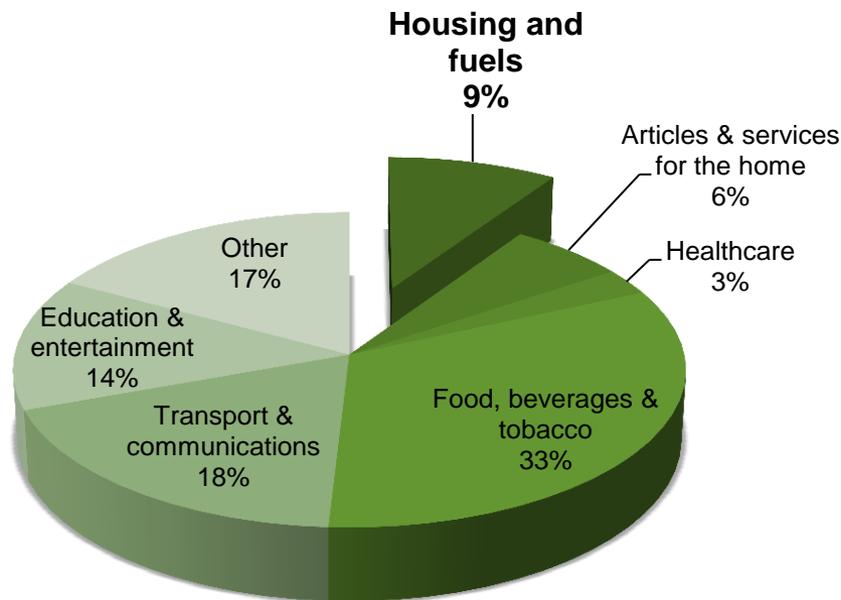
**A low cost fuel is critical for an improved cookstoves program, but it is also critical to address gaps in distribution, especially of LPG to rural and poor households.**

\* Excludes cooking (electricity not significantly used for cooking in Mexico)

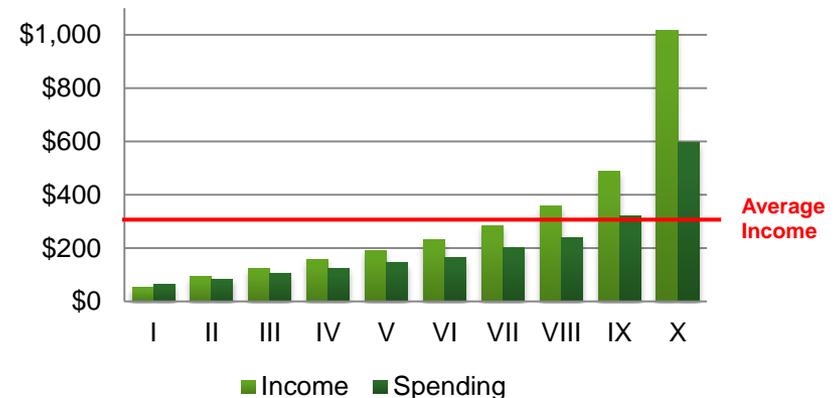
Sources: <sup>1</sup> CIA World Fact Book; <sup>2</sup>OECD Economic Survey Mexico 2011; <sup>3</sup> INE 2009 ;<sup>4</sup>Interviews; <sup>5</sup> El Colegio de Mexico 2010; <sup>6</sup> LPG Market Outlook, SENER 2007; <sup>7</sup>Masera 1996

On average, fuel does not represent a significant portion of the Mexican household spending, however, it does for the poorest segments.

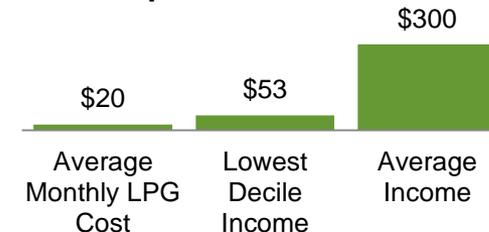
Average Household Spending Distribution



Monthly Income vs. Spending by Population Deciles <sup>1</sup>



Average Monthly LPG Cost as a Proportion of Income



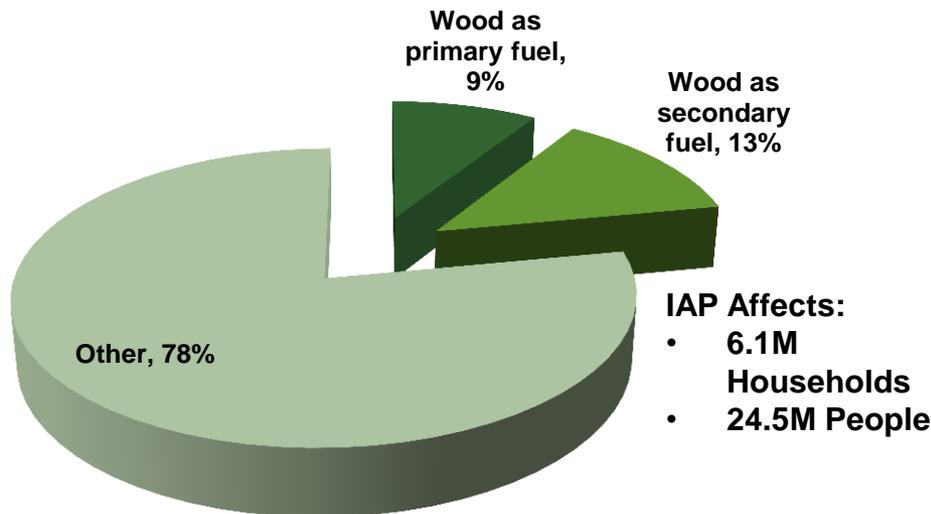
**-Implications-**

**Cost savings from more efficient stoves is likely to be a strong motivator for the adoption of cookstoves among the poorest segments.**

# Indoor Air Pollution (IAP) in Mexico

While 9% of households in Mexico (over 2.6 million) use solid fuels as the primary energy source, it is estimated that many others use them in conjunction with other fuels.

## How Many People are Impacted?



## What are the Health Impacts?

- 4,300 deaths per year due to household air pollution
- 58,900 Total DALY due to solid fuel use
- 0.4% percentage of national burden of disease attributable to solid fuel use

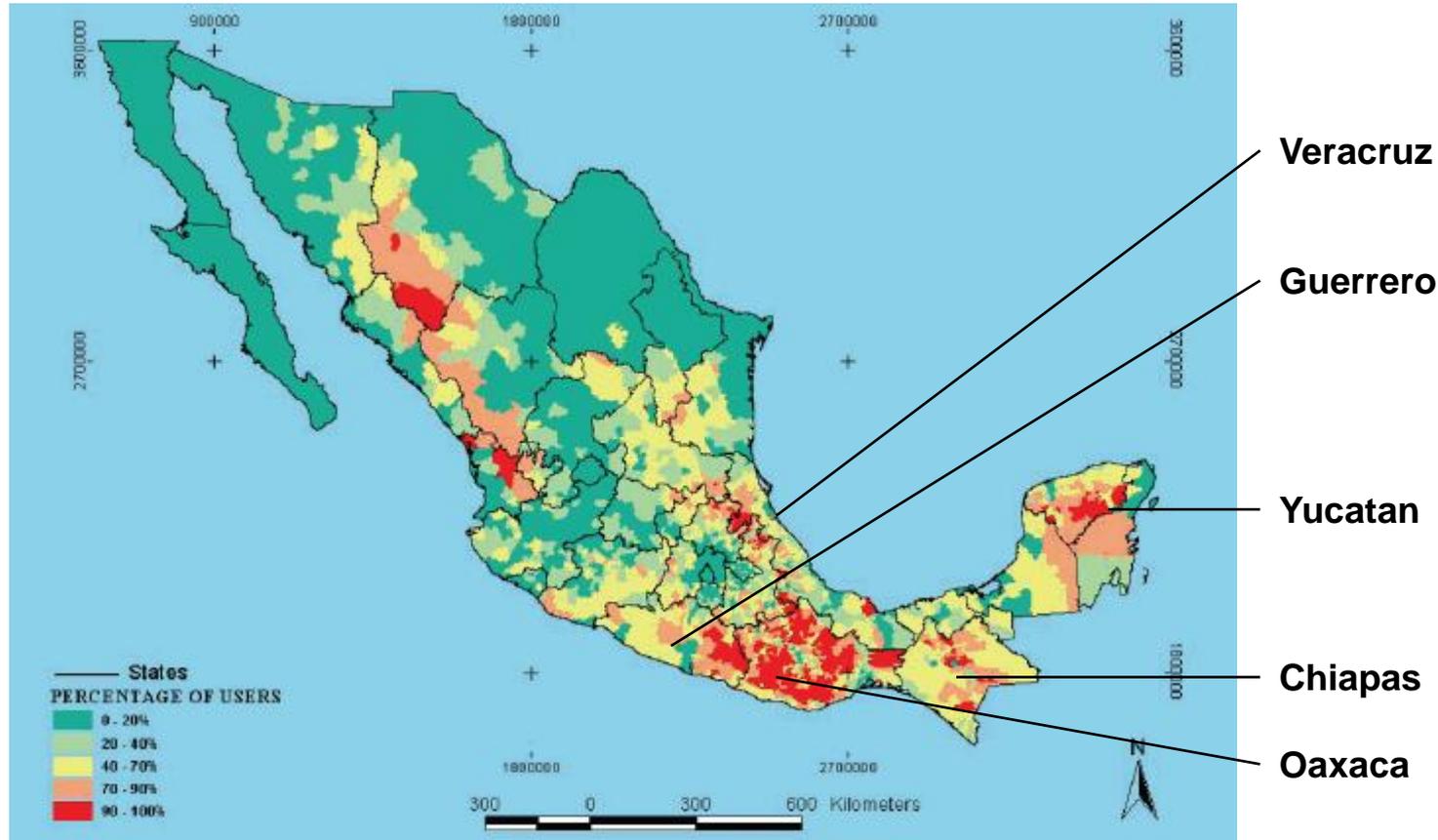
### - Implications -

***Although Mexico is a rapidly developing country, there is still a significant percentage of people who are vulnerable to indoor air pollution from solid fuel use.***

# Concentration of Biomass Smoke Exposure

Social and Environmental Impact

The problems related to biomass smoke exposure are concentrated in the South and Central regions.

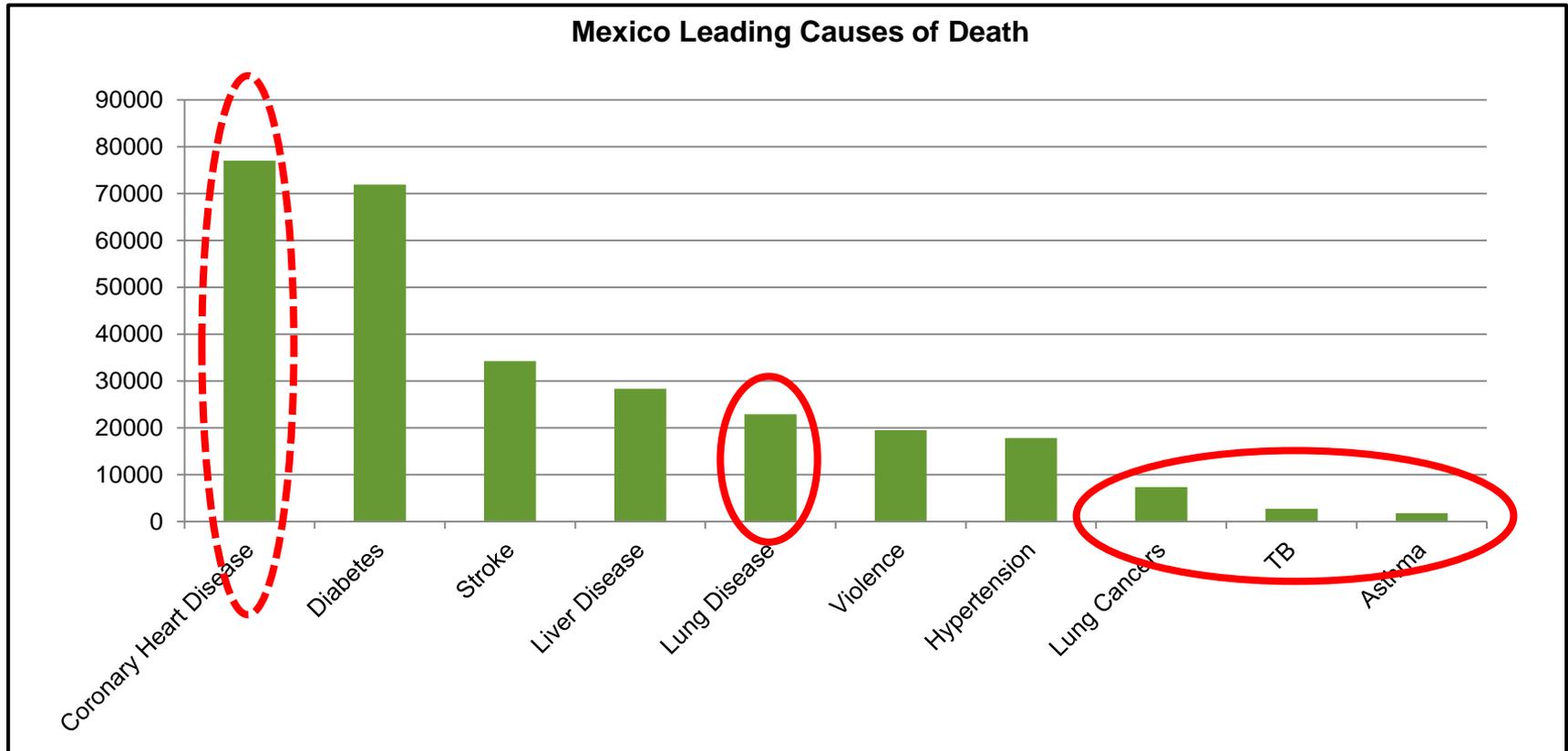


## - Implications -

***The concentration of biomass use across provinces suggests that any intervention must be tailored to the user preferences of the region.***

# Indoor Air Pollution Effects

IAP is known to be a contributing factor to lung disease, lung cancer, tuberculosis and asthma, and although heart disease is most likely to be related to obesity, some studies also link it to IAP.



## - Implications -

***The level of impact from indoor air pollution is not thoroughly researched, but could contribute to thousands of deaths from heart and respiratory diseases.***

# Indoor Air Pollution vs. Other Priorities

Social and Environmental Impact

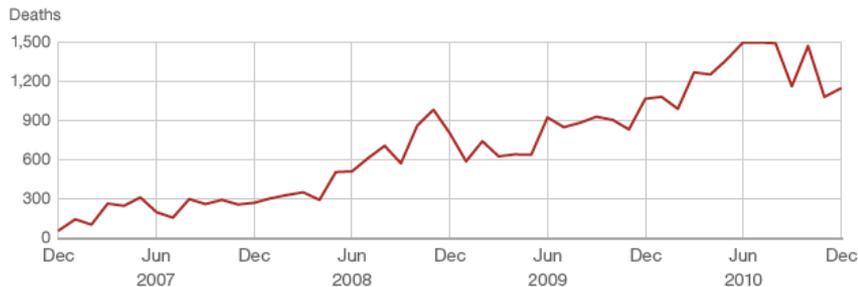
While HAP is an important issue, deaths from drug violence and diabetes are more publicized and receive more focus from government and mainstream media.

## Drug Violence

*“2011 drug violence kills nearly 13,000 in Mexico, new figures show”*  
-CNN

*“Pope Benedict XVI condemns Mexico's drug violence”*  
-BBC

The rising death toll



Source: Mexican government

## Diabetes

*Type 2 diabetes is the leading cause of death among adults*  
-2007 National Death Registry

*An obesity epidemic here ...affects 24 percent of men and 21 percent of women over the age of 35 years.*  
-World Health Organization



## **- Implications -**

***Stakeholders such as the government and communities may not view indoor air pollution as a priority issue, given the urgency of drug violence and diabetes.***

# The Role of Gender

**Women play an integral role in the Mexican cookstove market and several NGOs utilize their experience and networks across the board, from raising awareness, product development to promotion.**

## Role of Gender in the Household

- 25% households are headed by women – but this is due in part to migration of men to the U.S. or within Mexico
- Both genders collect wood in Mexico, but women are the ones that cook
- In recent decades the number of children per family has been decreasing due to government incentives, women moving to cities for work and an increase in education rates for girls -the average woman now has 2.4 children
- Women are becoming more independent and spending more time outside the home due to the smaller family size

## Role of Women in the Cookstove Sector

- Several NGOs like U'yoolche work primarily with women from cookstove design to promotion and training
- Women community leaders have been successful promoters of stoves where they were encouraged to do so by implementing NGOs
- Macho-ism exists but it does not impact decision making, especially for cookstove selection – the main issue is lack of awareness of both men and women

## Barriers to further involvement

- Awareness programs need to involve the entire family to maximize success. Even if women are trained to build stoves themselves, men have shown interest in participating in the process, and children have sometimes acted as translators and even as catalysers to encourage the parents to use the stoves
- For in situ construction stoves, the woman needs to be present when the base is constructed so that she has a say on where it is located and she is happy to use it afterwards

### **- Implications -**

***The continued presence of women in the Mexican stove sector improves the ability to connect with end consumers and increases the potential for growth, especially as they become more independent.***

# Environment Impacts

By the end of 2012 the government's cookstove distribution programs are estimated to have contributed to the preservation of at least 1.8 million trees and a reduction of emissions of 155 thousand tCO<sub>2</sub>.

Impact over time of improved cookstoves distributed by SEDESOL

Ejercicio fiscal	Núm. de estufas ecológicas		2007	2008	2009	2010	2011	2012	Árboles preservados/ disminución tCO <sub>2</sub> e. aprox.
2007	183		5,856	5,856	5,856	5,856	5,856	2,928.00	32,208
			494	494	494	494	494	247.05	2,718
2008	56,177			1,797,664	1,797,664	1,797,664	1,797,664	898,832	8,089,488
				151,678	151,678	151,678	151,678	75,839	682,551
2009	89,408				2,861,056	2,861,056	2,861,056	1,430,528	10,013,696
					241,402	241,402	241,402	120,701	844,906
2010	142,473					4,559,136	4,559,136	2,279,568	11,397,840
						384,677	384,677	192,339	961,693
2011	96,652						3,092,864	1,546,432	4,639,296
							260,960	130,480	391,441
2012	115,107							1,841,712	1,841,712
								155,394	155,394
Total	500,000								36,014,240
									3,038,702

- Around 30 million square meters of wood are extracted annually in Mexico for use as fuel, which is more than three times the one used for industrial purposes (Caballero, 2010)
- Improved cookstove distribution programs are part of the government's goal to decrease the country's greenhouse emissions by 50% by 2050 with respect to the 2000 baseline

## - Implications -

**The replacement of traditional biomass cookstoves with clean cookstoves is a valuable contributor towards Mexico's ambitious emissions reduction and deforestation programs.**

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**Appendix**

**The customer segmentation in this section is an illustrative example of how the Mexican market could be grouped. It is based on the following assumptions:**

- This customer segmentation is designed to provide a high-level view of the market and strengthen the understanding of the customer base in Mexico
- The segmentation is based on a preliminary market assessment and has used a combination of both primary and secondary research. Further refinement of customer segmentation and customer profiles may be required for specific programmes and regions
- Estimations of use of biomass in Mexico published by numerous well-known sources vary greatly (between 14% and 25% of the population). This customer segmentation seeks to arrive to a mid point within this range, and it is based on official data published by CONAPO<sup>1</sup> in conjunction with a report from SEDESOL that correlates level of marginality with use of firewood<sup>2</sup>
- The population size by level of marginality differs depending on whether the tally is done by municipality or by “locality” (one or more communities with similar characteristics within a municipality). While it is easier to plan interventions by municipality, this does not always address all communities with high and very high marginality levels across the country, which is why this analysis is done by “locality”
- Based on interviews, it is assumed that communities of high and very high marginality that use LPG as primary fuel, also use biomass as a complementary cheaper fuel source

# Consumer Landscape in Mexico

The population of Mexico is extremely disperse, especially those living in poverty and extreme poverty which are the focus of the government's social development programs.

“Communities with low number of inhabitants have notable deficiencies in access to services and basic infrastructure. However, looking carefully at the different variables that make up the marginality index shows us that in absolute terms -and given the concentration of the population in urban centers- there live a large number of people with significant deficiencies similar to those reported by the rural population.

*MARGINALITY INDEX, CONAPO, 2010*

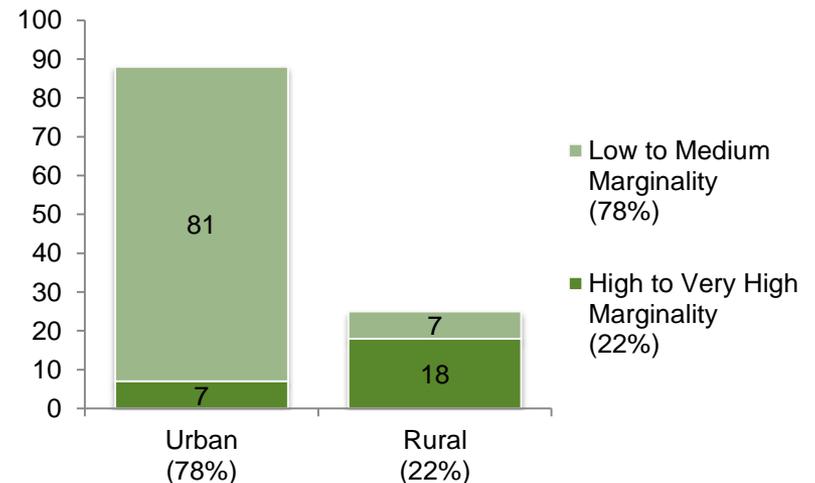
“Mexico is a country that characterizes itself by a polarized population. The disperse distribution of the population represents a great challenge to the provision of minimal levels of wellbeing to the population that lives in small communities, since providing infrastructure and services becomes costly as there are not economies of scale.”

*PRIORITY ZONE DEVELOPMENT PROGRAM, SEDESOL, 2008*

## Understanding the Mexican Consumer Landscape

- 90% of the communities (173,409 out of 192,245) have under 500 inhabitants
- 5% of the population (6 million) is indigenous, 95% of which lives in poverty and extreme poverty
- Almost 5 million people live in isolated areas with no direct access to roads
- When aggregated, the areas with the highest number of poverty and extreme poverty localities are the south east and west (particularly the states of Chiapas, Guerrero, Oaxaca, Puebla and Veracruz)

## Population Distribution by Marginality (in Million)\*

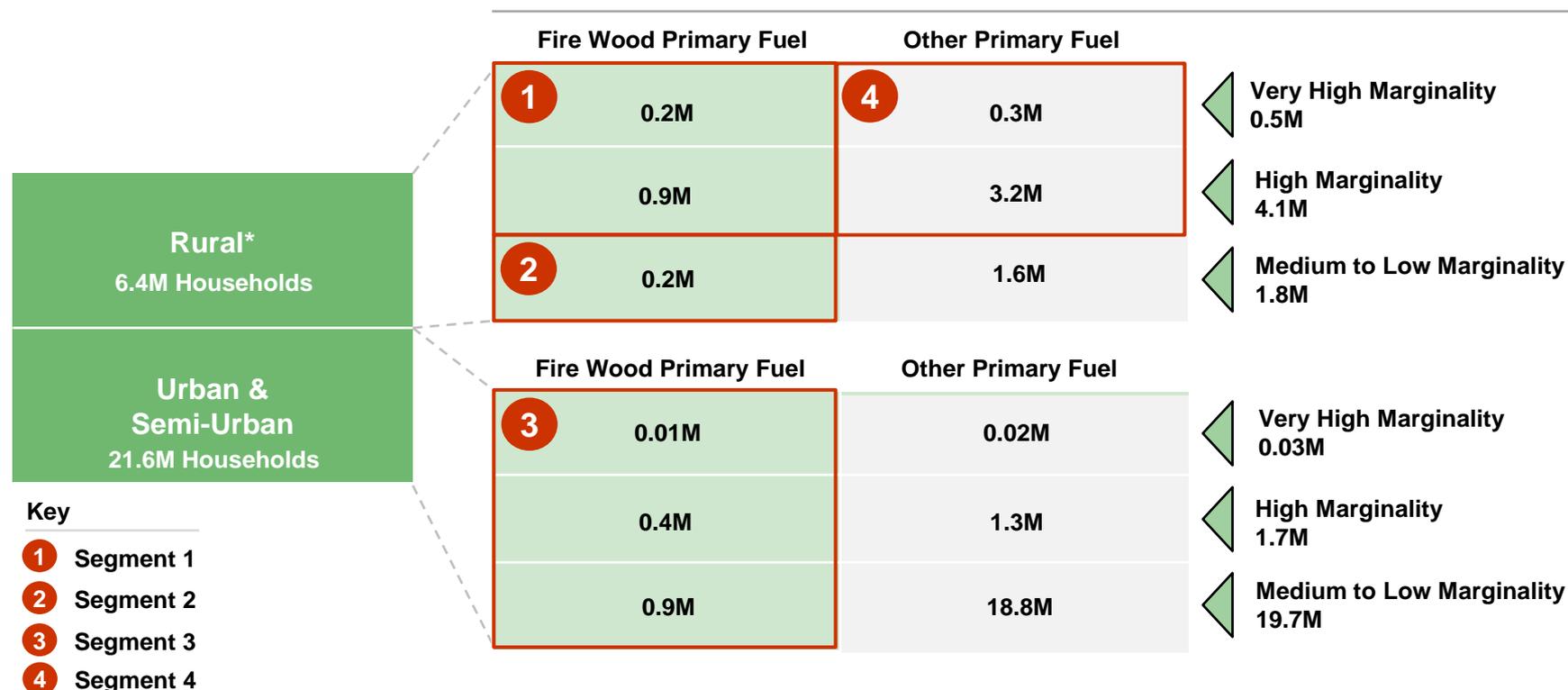


\* Based on a tally by "locality" (one or more communities with similar characteristics within a municipality), which might vary slightly from the numbers calculated by municipality

# Target Market Identification

Although the large majority of the population has access to electricity and gas, both the lack of means to pay for it and traditional cooking habits result in 9% still using fire wood as primary fuel. Additionally, many of the poorest households in rural areas use wood as secondary fuel.

NUMBER OF HOUSEHOLDS BY FUEL USED TO COOK & MARGINALITY LEVEL



## - Implications -

**The potential target market for a cookstove intervention comprises a population of over six million households located both in rural and urban communities.**

\* Rural is defined as localities with under 2500 inhabitants

Sources: Índice de Marginación por Localidad 2010 (CONAPO); Diagnostico sobre el Programa para el Desarrollo de Zonas Prioritarias 2008 (SEDESOL); % of households that use firewood, ENIGH 2006, Interviews

# Segment Profiles

The targeted population can be segmented into four groups: 1) Rural Poor & Very Poor/ Fire Wood Primary Fuel & 2) Rural Non-Poor/ Fire Wood Primary Fuel...

1



**Rural Poor & Very Poor/ Fire Wood Primary Fuel**

2



**Rural Non-Poor/ Fire Wood Primary Fuel**

Size in Households	<ul style="list-style-type: none"> <li>• 1.1 million</li> </ul>	<ul style="list-style-type: none"> <li>• 0.2 million</li> </ul>
Profession	<ul style="list-style-type: none"> <li>• Unemployed, subsistent farmer</li> </ul>	<ul style="list-style-type: none"> <li>• Street vendor, farmer, brick layer</li> </ul>
Household Income	<ul style="list-style-type: none"> <li>• \$1.8 USD/day</li> </ul>	<ul style="list-style-type: none"> <li>• More than \$3 USD/day</li> </ul>
Cooking Device & Fuel	<ul style="list-style-type: none"> <li>• Traditional open fire</li> </ul>	<ul style="list-style-type: none"> <li>• Traditional open fire</li> </ul>
Cooking Location	<ul style="list-style-type: none"> <li>• Indoors or outdoors depending on region</li> </ul>	<ul style="list-style-type: none"> <li>• Indoors or outdoors depending on region</li> </ul>
Cooking Frequency	<ul style="list-style-type: none"> <li>• Three meals per day</li> </ul>	<ul style="list-style-type: none"> <li>• Three meals per day</li> </ul>
IAP Exposure	<ul style="list-style-type: none"> <li>• High in enclosed homes, medium in open homes (e.g. Yucatan area)</li> </ul>	<ul style="list-style-type: none"> <li>• High in enclosed homes, medium in open homes (e.g. Yucatan area)</li> </ul>
IAP Awareness	<ul style="list-style-type: none"> <li>• Low</li> </ul>	<ul style="list-style-type: none"> <li>• Medium</li> </ul>
Environment Impact	<ul style="list-style-type: none"> <li>• High</li> </ul>	<ul style="list-style-type: none"> <li>• High</li> </ul>
Barriers to Switch	<ul style="list-style-type: none"> <li>• Awareness of alternative products</li> <li>• Stove affordability</li> </ul>	<ul style="list-style-type: none"> <li>• Awareness of alternative products</li> <li>• Gas availability</li> </ul>
Willingness to Pay	<ul style="list-style-type: none"> <li>• Low, cannot afford</li> </ul>	<ul style="list-style-type: none"> <li>• Medium, but it will require awareness &amp; promotion campaigns</li> </ul>
Purchase Drivers	<ul style="list-style-type: none"> <li>• Health</li> <li>• Wood savings</li> </ul>	<ul style="list-style-type: none"> <li>• Health</li> <li>• Wood savings</li> <li>• Could be a requirement to receive “Oportunidades” benefits</li> </ul>

# Segment Profiles

## ... 3) Urban / Fire Wood Primary Fuel, and 4) Rural Poor & Very Poor / Fire Wood Secondary Fuel

3



Urban / Fire Wood Primary Fuel

4



Rural Poor & Very Poor / Fire Wood Secondary Fuel

Size in Households	<ul style="list-style-type: none"> <li>• 1.3 million</li> </ul>	<ul style="list-style-type: none"> <li>• 3.5 million</li> </ul>
Profession	<ul style="list-style-type: none"> <li>• Factory worker, street food vendor</li> </ul>	<ul style="list-style-type: none"> <li>• Unemployed, subsistent farmer</li> </ul>
Household Income	<ul style="list-style-type: none"> <li>• All</li> </ul>	<ul style="list-style-type: none"> <li>• \$1.8 USD/day</li> </ul>
Cooking Device & Fuel	<ul style="list-style-type: none"> <li>• Traditional wood (open fire)</li> </ul>	<ul style="list-style-type: none"> <li>• Traditional wood (open fire)</li> </ul>
Cooking Location	<ul style="list-style-type: none"> <li>• Indoors or outdoors depending on region</li> </ul>	<ul style="list-style-type: none"> <li>• Indoors or outdoors depending on region</li> </ul>
Cooking Frequency	<ul style="list-style-type: none"> <li>• Three meals per day</li> </ul>	<ul style="list-style-type: none"> <li>• Three meals per day</li> </ul>
IAP Exposure	<ul style="list-style-type: none"> <li>• High</li> </ul>	<ul style="list-style-type: none"> <li>• Medium (less frequency as other segments)</li> </ul>
IAP Awareness	<ul style="list-style-type: none"> <li>• Medium</li> </ul>	<ul style="list-style-type: none"> <li>• Low</li> </ul>
Environment Impact	<ul style="list-style-type: none"> <li>• High</li> </ul>	<ul style="list-style-type: none"> <li>• High</li> </ul>
Barriers to Switch	<ul style="list-style-type: none"> <li>• Awareness of alternative products</li> <li>• Stove affordability</li> <li>• Gas affordability and availability</li> </ul>	<ul style="list-style-type: none"> <li>• Awareness of alternative products</li> <li>• Stove affordability</li> <li>• Gas affordability and availability</li> </ul>
Willingness to Pay	<ul style="list-style-type: none"> <li>• Poorest cannot afford, others might be willing to pay but it will require awareness &amp; promotion campaigns</li> </ul>	<ul style="list-style-type: none"> <li>• Low, cannot afford</li> </ul>
Purchase Drivers	<ul style="list-style-type: none"> <li>• Health</li> <li>• Wood savings</li> </ul>	<ul style="list-style-type: none"> <li>• Health</li> <li>• Wood savings</li> <li>• Could be a requirement to receive "Oportunidades" benefits</li> </ul>

# Customer Segmentation Summary

The rural poor and very poor –whether they currently use fire wood as primary fuel or in conjunction with LPG- are the largest customer segments for improved cookstoves. Indigenous households within all segments tend to use fire wood more often than non-indigenous ones<sup>1</sup>.

Customer Segment Characteristics

Segment	Size	IAP Exposure	IAP Awareness	Affordability	Willingness to Pay	Alternative Use	Distribution Access
1 Rural Poor & Very Poor/ Fire Wood Primary Fuel	High	Medium-High	Medium-High	Minimal	Minimal	Medium-High	Medium-High
2 Rural Non-Poor/ Fire Wood Primary Fuel	Low	Medium	Medium	High	Medium-High	Medium	Medium-High
3 Urban / Fire Wood Primary Fuel	High	High	Medium-High	Medium-High	Medium-High	Medium	High
4 Rural Poor & Very Poor / Fire Wood Secondary Fuel	High	Medium	Medium-High	Minimal	Minimal	Medium-High	Medium

Key | ○ Minimal | ◐ Low | ◑ Medium | ◒ Medium-High | ● High

Some indigenous communities living within non-poor municipalities are included in this group

Alternative uses of wood such as smoking food or heating could be the reason for secondary use

Lack of distribution of alternative fuels could be the reason for use of wood

**- Implications -**

**Although improved biomass stoves have been the only alternative pursued by most previous programs, LPG stoves could be an option for the urban or the rural non-poor segments.**

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**Appendix**

Government policy relating to cookstoves largely centers around poverty and deforestation, which are areas of concern due to the considerable environmental and economic implications.

## Government Policies & Programs Relevant to Cookstoves

- Strategies and Policies
  - Vision 2030 (2007)
  - Plan Nacional de Desarrollo (PND 2007-2012)
  - Estrategia 100x100 (2007)
- Programs
  - SEMARNAT Climate Change Mitigation - PECC program
  - SAGARPA Rural Development - PESA program
  - SEDESOL Poverty Reduction – PDZP program
  - INMUJERES Women Livelihoods – Fondo PROEQUIDAD program
  - SEDESOL Rural Supply – PAR program
  - CONAFOR Biomass Energy – PND Program

*Note: This list was compiled from interviews with government and non government players in Mexico and it is by no means exhaustive.*

# Government Programs Relevant to Cookstoves

Mexico has several environmental & social programs that target the poor and rural communities.

	Climate Change Mitigation	Rural Development	Poverty Reduction
<b>Program</b>	<b>SEMARNAT PECC 2008</b>	<b>SAGARPA PESA 2011</b>	<b>SEDESOL PDZP 2012</b>
<b>Objective</b>	A reduction of 50% in Mexico's GHG emissions by 2050 compared with the volume emitted in the year 2000. This includes a reduction in total annual emissions of 51 million tons of CO2e in 2012, with respect to the business as usual scenario.	To help poor rural communities develop and achieve their autonomy through the following three objectives: <ol style="list-style-type: none"> <li>1. Develop capabilities of the communities</li> <li>2. Food security</li> <li>3. Increase in income</li> </ol>	To improve the livelihoods of high & very high marginality communities through improved access to infrastructure and services. For 2012 the target includes 11M people in rural areas, a number of people in urban areas and all predominantly indigenous communities.
<b>Results</b>	At the time of this report the mitigation goal M43, which targeted the installation of 600 thousand efficient wood burning stoves by the end of 2012 was reported to be 72% fulfilled as follows: SEDESOL: 384k of 500k stoves SAGARPA: 46k of 100k stoves Actual impact in emissions reduction and improved livelihoods is largely criticized as there have not been official reports.	To date PESA has been rolled out successfully in 16 states and 8000 communities (out of 104,000 communities in all Mexico). As part of this program, 46k stoves have been distributed to date (see PECC) together with other innovative technologies. The success of the program has been partly due to the methodology provided by FAO, which includes follow-ups.	Although no official results about livelihood impact have been found, it is known that SEDESOL has distributed at least 384,000 stoves to date (see PECC).

## - Implications -

***Cookstove initiatives have been an important component of some of the government's environmental and social programs.***

# Government Programs Relevant to Cookstoves (cont'd)

Cookstove Industry Assessment

Mexico also has several gender and equality programs that target the same poor and rural communities.

	Women Livelihoods	Rural Supply	Biomass Energy
<b>Program</b>	<b>INMUJERES Fondo Proequidad</b>	<b>SEDESOL PAR (Programa de Abasto Rural)</b>	<b>CONAFOR PND (2008-2010)</b>
<b>Objective</b>	To finance civil association (NGOs) projects that aim to favor women's living conditions particularly around social, political, economic and cultural aspects. Organizations present projects through a competition each year and one wins.	Contribute to the wellbeing and equality of opportunities of the inhabitants that belong to rural communities that have a poverty situation through an efficient supply of basic and complementary goods, especially to remote areas, with society participation.	To foster the optimal use of energy produced from forests (including rainforests & arid regions), to incent biomass energy production research, development and transfer of technology, and to integrate biomass energy production and sustainable forest management.
<b>Results</b>	In the 10 <sup>th</sup> edition of the competition, the NGO Desarrollo Rural Quetzalcoatl, which does improved cookstove installations was awarded \$270,000. They only built one stove in each of four municipalities funded by InMujeres as part of a demo/ training workshop. The communities then requested an additional 183 stoves, which were financed partially by the NGO Quetzalcoatl and the rest by the community. InMujeres sees this as a pilot program to be replicated in other communities.	Currently there are about 25,000 community stores serving nearby communities, covering over 100,000 of the 192,000 communities in Mexico. The program owns regional distribution centers and a fleet of trucks and horses to do the distribution, with which they can reach any rural community across the country, even the most remote areas. The program is self-sufficient, and other services such as pension payment and microcredit are offered through their stores.	88,881 stoves were successfully installed between 2008 and 2010. Stove choice was based on community acceptance and included in-situ construction (Patsari & Lorena) and prebuilt ones (ONIL & Mexalit). The beneficiaries were groups of approximately 20 families that initiated a request for stoves. The funding came all from CONAFOR (Programa Proarbol). The program had a training component given by technical advisors accredited by CONAFOR.

## - Implications -

***Even if not currently pursuing cookstove initiatives, several other government programs could provide critical support to the Alliance for cookstove projects.***

# Standards and Testing

There isn't a national stove standard or an official lab to assess stoves in Mexico. At the moment there are two institutions (INE-CENICA and IPN) working independently on the development of stove standards.

## Organization



## Involvement

- CENICA is leader on standard development in México
- CENICA leads a cookstove standard working group with Instituto Nacional de Salud Pública (INSP), Instituto Nacional de Enfermedades Respiratorias (INER), Centro de Investigación en Ecosistemas (CIECO, UNAM) and ONIL A.C.
- This group developed a cookstove guide -not an official standard yet-based on heat transfer and analysis of emissions and exposure of pollutants to the users. This guide is independent from international standards, and the latest version was published in June 2011
- In Mexico there isn't an official lab to assess cookstoves -testing so far has been done by independent organizations (e.g. UC Berkley, Aprovecho, CENICA)
- There is a proposal to create a national lab by the CIECO (UNAM) probably to be finished by the end of 2012, which CENICA will support with assessment services



(IPN)

- IPN is recognized as a technical authority in the country together with the Universidad Autónoma de Mexico, however, they have no prior experience or research around cookstoves so they are new to the field
- IPN was engaged by SEDESOL in 2010 to do the official technical compliance testing for their cookstove program tenders due to the need for a quick baseline that would not delay their program (a national standard is estimated to take four to six years to be approved)
- IPN is working independently and has not engaged other national institutions on this

## - Implications -

***Collaboration between these two organizations would minimize duplication of efforts, maximize results, and facilitate stove choice for the government and other institution's programs.***

# Current Technology Landscape

Several models of improved wood burning stoves have been distributed in Mexico, although all of them together are only used by less than 10% of the target population.

## Open Fire



- A traditional open fire that uses a grill or an iron skillet (“comal”) over three stones to support the pot whilst cooking food
- These are found mostly in very poor communities, inside or outside the house depending on the region

- Use
- Availability

## Onil



- Portable stove developed in Guatemala
- About 130,000 have been installed in Mexico to date
- The model includes three concrete pieces that need to be assembled with additional materials (e.g. pomex gravel to preserve the heat around the combustion chamber)

- Use
- Availability

## Citlalli



- Another portable improved wood burning cookstove distributed by the government in previous programs
- The combustion chamber is small and needs wood chips which requires more labor to create
- There is no data around where it was installed & it is no longer being made

- Use
- Availability

## Mexalit



- An improved wood burning cookstove distributed by the government in previous programs
- There is no data around where it was installed
- Improved versions of it exist today

- Use
- Availability

Key |  Minimal  Low  Medium  Medium-High  High

# Current Technology Landscape

Several in situ construction wood burning stoves have been developed by different NGOs based on local materials and user requirements. Today they are the most prevalent among improved stoves in Mexico.

## Patsari



- Self-construction. Users build it based on specifications
- Once installed, these stoves cannot be moved
- About 180,000 stoves were installed mostly in Mexico & Michoacan
- It's the most prevalent of the improved wood burning stoves in Mexico
  - Use
  - Availability

## Tuumben Kooben



- An adaptation of the Patsari stove developed in the Yucatan peninsula with local materials and regional needs (e.g. chimney doesn't go straight up to avoid fires due to sparks on the traditional guano roof)
- The base height and design can vary based on the user's preference
  - Use
  - Availability

## Tonacalli



- Another self-construction improved wood burning stove –this one made of bricks with an isolated combustion chamber, a water heater and a built-in iron skillet
- It is claimed to last longer, and it is built by the families, who are the ones that maintain it
  - Use
  - Availability

## Lorena



- One of the earliest improved firewood stoves in Mexico, made of mud and sand with a chimney, originally from Guatemala
- Eliminates smoke but consumes more wood than open fires and lasts less than a year
- About 20,000 stoves were installed in the state of Guerrero by 1988
  - Use
  - Availability

Key |  Minimal  Low  Medium  Medium-High  High

# Current Technology Landscape

While existing solar cookers provide the greatest savings to users, they are not feasible as main cooking technology due to the lack of a “comal” to make tortillas. Among wood burning stoves, the Ecocina is the cheapest.

## Solar Cookit



- Low cost solar pot heated with the sun through the use of a cardboard reflector and a heat-resistant plastic bag around the pot, which acts like a greenhouse
- It weighs half a kilogram and folds
- Limited useful life, inability to make tortillas and ongoing need for the plastic bags
- Use
- Availability

## Hotpot Solar Cooker



- Pot that allows cooking food solely based on sun energy
- Most useful in temperate, arid and semi arid zones
- Good for cooking beans & stews, but not for tortillas as it doesn't have the required “comal” –it works well in conjunction with improved wood burning stoves that have a “comal”
- Use
- Availability

## Ecocina



- Portable cement stove with a comal on top
- Pots are put on top of the comal with a metal skirt to preserve the heat
- Stove height can be adjusted because the stove exterior is not hot and can be put on any surface
- Use
- Availability

Key



Minimal



Low



Medium



Medium-High



High

# Current Technology Landscape

Rocket stoves made abroad can be manufactured at a large scale but since they are not significantly present in Mexico, there is no conclusive data on user adoption –size might be a deterrent.

**Ecozoom**



- Small portable metal and ceramic rocket stove
- A comal can be placed on top of it, but stove size could be a limitation
- The Zoom Stove also comes with an adjustable Pot Skirt that increases heat transfer to the pot
- About 10,000 installed in Mexico so far

- Use ○
- Availability ●

**Envirofit**



- Small portable metal rocket stove
- Its small size can be a limitation for tortilla making
- Although it is very successful in other countries, it hasn't yet been installed in Mexico

- Use ○
- Availability ○

**Delher**



- Portable metal wood burning stove with chimney
- It comes disassembled in a box
- Manufactured in Mexico D.F. in the same factory that LPG stoves
- It hasn't been tested in communities yet

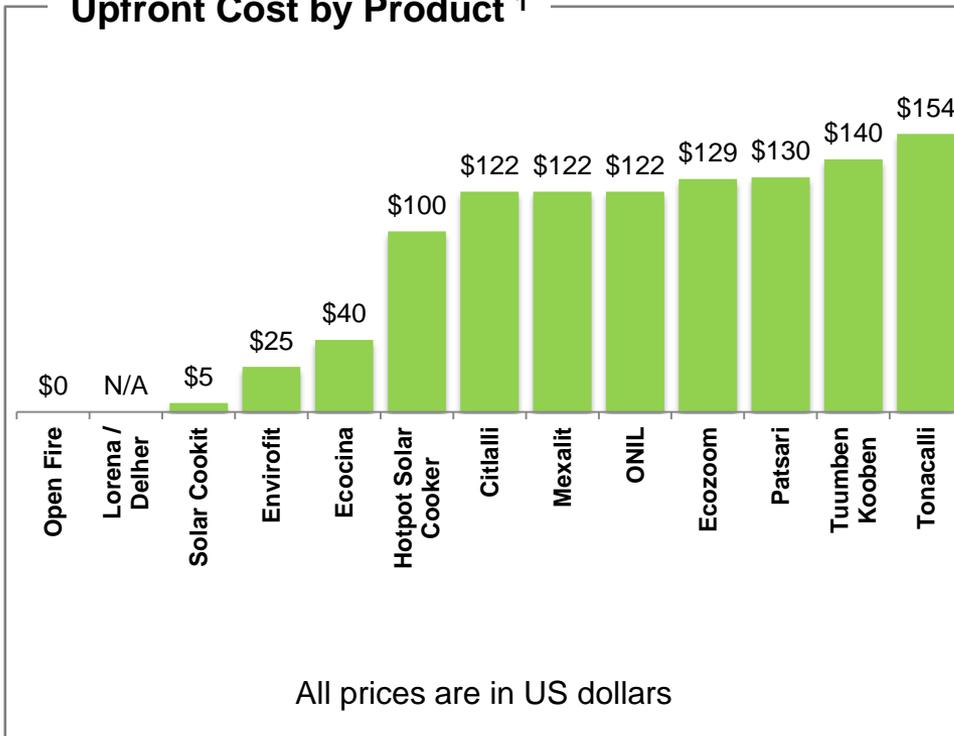
- Use ○
- Availability ●

Key | ○ Minimal    ◐ Low    ◑ Medium    ◒ Medium-High    ● High

# Available Cookstove Cost

Most improved stoves distributed in Mexico have been fully subsidized, resulting in sub-optimal adoption rates, useful life of stoves and willingness of others in the community to buy one.

Upfront Cost by Product <sup>1</sup>



## Observations

- The Patsari, Tuumben Kooben and Tonacalli have the most expensive upfront cost, but most of them were fully subsidized. As a result, other people in the community expect to receive them for free as well, and are not willing to pay for it themselves.
- A pilot project to test the acceptance of microcredit financing with 0% interest on 30 families in Yucatan with the Tuumben Kooben was not only successful, but better usage results were observed as the users took care of the stove more than others who had received it for free.
- The Ecocina, which is made of cement- is the cheapest wood burning stove with a built in comal.
- Although the hotpot solar cooker has a high price tag, users reported making the cost back in wood savings within less than six months.

## - Implications -

***Even if significantly higher than other countries, cookstove pricing has not been the limiting factor to adoption in Mexico, but the fact that stoves have generally been subsidized. A financing scheme that includes at least a small cost to the owner -even if it is through microcredit- would yield better results according to most NGOs.***

# Overview of Cookstove Initiatives in Mexico

Many organizations have pursued cookstoves initiatives in Mexico, with the largest scale ones led by the government. No holistic approach or national level coordination of initiatives exist.

## Private Manufacturers

Private manufacturers are focused on producing and selling stoves through a profitable business model.

- Onil
- Ecozoom
- Envirofit
- Delher
- Mexalit
- Inversiones Falcon
- Eric Ramirez Factory
- Mujeres Trabajadoras
- Solar Household Energy

## Government

The government is focused on distributing stoves, and developing stove national standards.

- SEMARNAT (INE, CONAFOR, CONAMP)
- SEDESOL (Microrregiones)
- SAGARPA (Desarrollo Rural)
- INMUJERES

NGOs have a variety of focus areas, including stove distribution, behavioral changes and training/education.

- GIRA
- U'yo'olche
- FMCN
- Stove Team International
- Piraraja
- Peace Corps
- Sierra Gorda
- Hidalgo Women's Coop.
- Apoyo a Gente Emprendedora
- Quetzalcoatl

## NGOs

Academic institutions are focused on research and reporting, particularly around forestry and stove design.

- Instituto Politécnico Nacional
- Universidad Autónoma de México
- Universidad de Yucatán
- Universidad Autónoma de Baja California

## Academia

### - Implications -

***The existence of a large number of previous initiatives in Mexico is encouraging and will allow the leverage of many lessons learnt. The challenge is in coordinating all parties to maximize results.***

# Mexico Stakeholder Mind Map

PLACEHOLDER

KEY:  Current Cookstove Project  Government  NGO  Private Sector  Academia

# Existing Markets for Cookstoves and Fuels

There are no local markets for improved cookstoves today in Mexico. Most improved pre-built cookstoves or materials for building in situ stoves have been distributed through government or NGO programs.



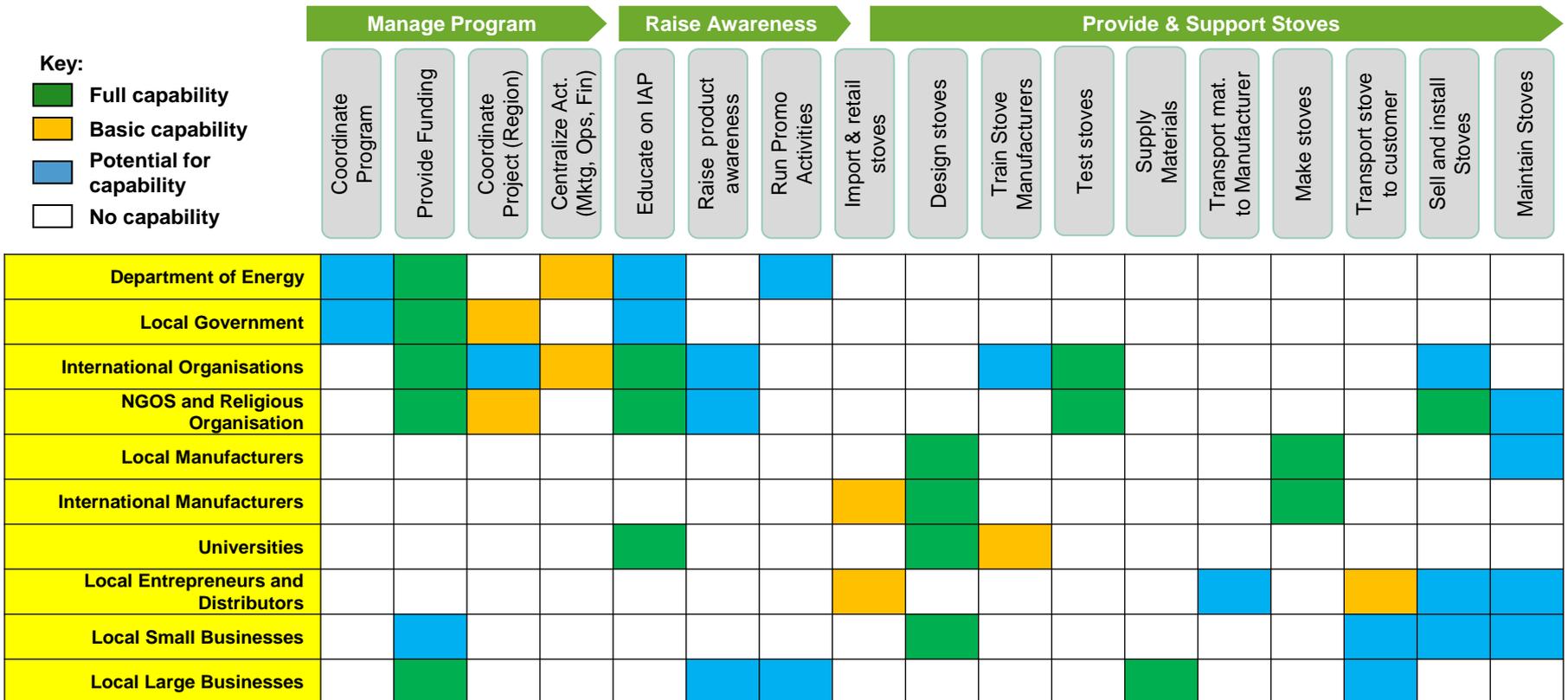
	‘Centralized coordination’		‘Decentralized coordination’					
<i>Channel</i>	<b>Projects</b>	<ul style="list-style-type: none"> <li>Most cookstoves distributed through projects to date fall under “NGO networks” or “Local authorities”</li> <li>Regarding energy sources, initiatives are under development –e.g. CONAFOR’s projects to:                             <ul style="list-style-type: none"> <li>generate energy from forest residues</li> <li>take advantage of wood lost through hurricanes</li> <li>develop pellets or bricks for domestic consumption</li> </ul> </li> </ul>	<b>NGO networks</b>	<ul style="list-style-type: none"> <li>Local and international NGOs with deep community presence like U’yoolche, Solar Household Energy, Helps or Rotary International utilize their network to train local artisans and distribute stoves</li> </ul>				
<i>% of current improved stoves</i>	<b>0%</b>		<b>15%</b>	<ul style="list-style-type: none"> <li>The federal government cookstove programs are generally decentralized and run by the regional branches of the institution that leads each program (e.g. SEDESOL, SAGARPA, etc.)</li> <li>These programs usually coordinate efforts with local authorities and hire civil associations (NGOs) to work with the communities</li> </ul>	<b>Local authorities</b>	<ul style="list-style-type: none"> <li>Pre-built improved cookstoves are not sold in local markets today, but some materials to build the in situ construction ones are</li> <li>Wood is sometimes sold in local markets but it is mostly self-collected. LPG is generally distributed to the homes but can be bought in hardware stores</li> <li>The SEDESOL’s PAR program community-run stores are the only outlet for remote communities</li> </ul>	<b>Local markets</b>	<b>0%</b>

**- Implications -**

***The SEDESOL’s PAR program community-run stores could be a viable solution to distribute pre-built stoves or materials for in-situ construction ones to remote areas. An increased offer of certified technicians and trainers to work with the communities could also be helpful.***

# Cookstove Industry Value Chain

Gaps exist in several value chain areas, especially around program coordination, awareness raising, testing, monitoring & stove maintenance. Funding has been available so far, but it is unclear post 2012.



## - Implications -

**From the demand side, awareness campaigns would help people understand the health impact of open fires and the benefits of improved cookstoves. From the supply side, it is critical to develop a holistic program that can connect market players to maximize efforts at a national scale.**

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# Market Attractiveness

The government's goal to decrease the country's greenhouse emissions by 50% by 2050 with respect to the 2000 baseline is an aggressive one as emissions are currently growing due to economic growth.

	Designated National Authority (DNA) & Programs of Activities (PoA)	Stove & Program Accreditation	Carbon Baseline	Country Classification	Scale of Program	Monitoring & Evaluation
Best Case ↑ ↓ Worst Case	Pre-existing DNA & related PoA	Pre-existing CDM-accredited stove program in country	Previous cookstove projects to leverage for baselining	Least Developed Country	Estimated income will significantly outweigh costs of registration & monitoring	Approved cookstove monitoring methodology in use in country
	<b>Pre-existing DNA; No PoA</b>	Pre-existing GS-accredited stove program in country	<b>Similar projects (e.g. Biomass) to use as proxy for baselining</b>	<b>Advanced developing country</b>	<b>Unclear business case for carbon financing activities</b>	Approved monitoring methodology in use in country
	Clear organizational candidate for role of DNA	No accredited stoves or stove programs in country	No previous projects to use as reference	Developed Country	Costs of registration & monitoring will likely outweigh income generated by carbon credits	<b>Clear monitoring partnership opportunities and capabilities</b>
	No clear candidate or competing agencies					Lack of monitoring capabilities or partnership opportunities

### - Implications -

**Although carbon credits for cookstoves don't exist in Mexico yet, the government is expected to be supportive of their development, as it would contribute to achieving the national emissions reduction target.**

# Carbon Finance Programs

In addition to 39 non-cookstove CERs, Mexico has currently three carbon cookstove programs in progress (pending registration or validation).

	Cookstove Project GS974 (GS VER)	GS Open POA	CDM Open POA
<b>Description</b>	<ul style="list-style-type: none"> <li>Emissions reduction in Michoacan and Mexico states by replacing open fires with the Patsari stove. Project focus is on funding to do the follow up (maintenance, operation and monitoring) of the stoves, not the initial cost and installation, since the government had already paid for this.</li> </ul>	<ul style="list-style-type: none"> <li>Diffusion of technologies with social benefits, not just environmental (i.e. improved cookstoves such as solar, heat retention and improved biomass, water filters, small scale renewable energy) across all Mexico. Focus on sustainability (capability building, project extension, development of complementary projects), not the initial financing to purchase stoves.</li> </ul>	<ul style="list-style-type: none"> <li>Diffusion of Onil stoves and use of revenue for market campaigns and awareness. Developing an open POA to allow for other projects and other types of stoves.</li> </ul>
<b>Participants</b>	<ul style="list-style-type: none"> <li>South Pole</li> <li>GIRA</li> </ul>	<ul style="list-style-type: none"> <li>Microsol</li> </ul>	<ul style="list-style-type: none"> <li>C-Quest Capital</li> <li>Helps International</li> </ul>
<b>Progress</b>	<ul style="list-style-type: none"> <li>Currently in the validation process, and doing corrective requests. Validation expected to be completed by mid-April.</li> <li>Target is approx. 13,000 stoves in 6 years.</li> </ul>	<ul style="list-style-type: none"> <li>Validation expected for mid-2012.</li> </ul>	<ul style="list-style-type: none"> <li>Registration expected by April 2012.</li> <li>Also looking at retrospective compensation in the voluntary market from Oct 2009.</li> </ul>

**- Implications -**

**Awareness of these open POAs should be raised both to project implementers and to the government so that they can consider how best to participate and enroll the cookstoves that they distribute.**

# Mexico Organisations

Despite only a few carbon financing projects related to cookstoves, Mexico has experienced organisations that can implement carbon projects.



- Microsol is a social company created in 2008 with the vision of working in the human development sector in a sustainable way, ensuring their own economic viability
- It's a consultancy that supports projects to spread technologies that have a double impact: social and environmental
- They developed the only POA in the voluntary market that has issued carbon credits (in Peru)
- They are present in Mexico since September 2011
- They focus on the voluntary market (with the Gold Standard)



- South Pole has a global footprint with headquarters in Zurich and 12 offices around the world, including one office in Mexico since 2008
- It has projects in 21+ countries focusing on carbon mitigation project development (for all markets), sales and marketing of carbon credits, consulting and IT solution development
- It has experience with cookstove projects in El Salvador, Mozambique and other countries
- In Mexico, in addition to the cookstoves project, they have other carbon projects focused on energy efficiency



- C-Quest is dedicated to originating and developing high-quality emission reduction projects around the world
- It was founded in 2008 and has offices in the US, Australia and Malaysia

# Carbon Market

Mexico is limited in the EU market after 2012 due to not being a “least developed country.” However, it can achieve success in other markets, especially since cookstove carbon credits are very attractive due to their social benefits.

Buyers of Credits	Current Situation	Issues	Demand Trend
European Union Emissions Trading Scheme	<ul style="list-style-type: none"> <li>The EU is the main market for carbon credits developed in Mexico through CDM</li> </ul>	<ul style="list-style-type: none"> <li>The EU has indicated that it will favour the group of least developed countries (LDCs)</li> <li>Mexico is not considered a LDC, hence it will be ineligible to sell credits after 2012</li> </ul>	 <b>Decreasing</b>
Other International Buyers (Voluntary)	<ul style="list-style-type: none"> <li>No cookstove carbon credits exist in Mexico yet</li> </ul>	<ul style="list-style-type: none"> <li>Cookstove carbon credit developers are optimistic about the prospects of this market once their CERs/VERs are issued as they believe that cookstove carbon credits are very attractive to buyers around the world due to their social benefits</li> </ul>	 <b>Increasing Potential</b>
Mexico Buyers (Voluntary)	<ul style="list-style-type: none"> <li>There is no domestic carbon market in Mexico today. Credits are sold in foreign markets</li> </ul>	<ul style="list-style-type: none"> <li>TBD</li> </ul>	N/A

### -Implications –

**-The prospects of cookstove carbon credits are positive, particularly in the voluntary markets. Open POAs have particular attractiveness as they allow smaller implementers to participate and can be leveraged across the entire country.**

# Government and Community Support

Lack of awareness and understanding from the government and the communities is a major challenge in setting up carbon projects. The replication of projects across states is difficult because baselines vary considerably.

## - Key Stakeholders -

### National Government

- Although the national government is involved in carbon financing projects, it has not gotten involved with carbon financing specific to cookstoves
- Lack of attention to the requirements of carbon credit development (e.g. additionality rule) has impacted the potential of cookstove carbon credit development in Mexico

### Local Communities

- Communities lack awareness and understanding of carbon financing and how they can benefit from it
- Critical to deliver results quickly to show that the project is helping the community

## -Implications –

***-Mexico might not be able to take full advantage of cookstove carbon credits unless the government's current approach to cookstove financing is revised and additional focus is put on monitoring.***

# Overall Carbon Finance Feasibility

Mexico represents a major opportunity for carbon financing, but coordination between the government and carbon credit developers is critical.

## - Supportive Market Criteria -

Existing Designation National Authority

Existing carbon finance cookstove programs already in process

Strong local organisations with carbon financing capabilities

## - Potential Risks-

Additionality issues due to full subsidies from the government or other organizations

Projects might not be replicable across states due to different baselines, which would limit economies of scale

Long term future of carbon market is unknown

## Opportunities

- Pursuing cookstove carbon financing in Mexico would be highly beneficial to increase adoption of improved cookstoves and should be done with multiple small scale projects that can be adapted to local communities.
- The assistance of local NGOs and carbon implementers will be critical.
- Ongoing assessment of the voluntary carbon market needs to be done to ensure that demand for carbon credits can be assessed and the feasibility of each project confirmed.

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# Cookstove Industry Summary

Whilst the Mexican market is large and many small cookstove initiatives exist, larger scale and longer term plans are required to fully overcome the IAP issue in the country.

Macro	Health & Social Issues	Consumer	Cookstove Industry	Carbon Finance
<ul style="list-style-type: none"> <li>+ Emerging market with an abundant supply of natural resources and a number of strong industries</li> <li>+ Government has multiple cookstove initiatives</li> <li>- Government changes every six years limit the long-term planning required for cookstove programs to succeed</li> <li>- Lack of coordination between the multiple government organizations limits large scale interventions</li> </ul>	<ul style="list-style-type: none"> <li>+ Poverty Reduction, National Health and Indigenous Programs can provide critical support to cookstove projects</li> <li>- No current involvement of the health department in cookstove projects as focus is on other national problems such as diabetes</li> <li>- Low consumer level awareness of the direct relationship between smoke and health problems</li> </ul>	<ul style="list-style-type: none"> <li>+ Large number of people using open fires even with access to electricity or gas</li> <li>+ The target market is likely to switch to improved cookstoves if they understand the savings that they can realize</li> <li>- Reaching the large number of small communities in the target market will be a challenge due to how disperse they are –some of them are even completely isolated</li> </ul>	<ul style="list-style-type: none"> <li>+ Strong and diverse private sector with a variety of cookstove designs available</li> <li>- One size does not fit all in Mexico due to regional cooking habits and climate variations</li> <li>- Prevalent in situ construction improved stoves make scalability a challenge</li> <li>- No national technical standards limit stove assessment and optimal selection</li> <li>- Monitoring and maintenance gaps</li> </ul>	<ul style="list-style-type: none"> <li>+ International organisations experienced and capable of running projects in the country</li> <li>+ Three cookstove carbon credit programs are in the process of registration/ validation</li> <li>+ Cookstove carbon credits are attractive in all markets due to their social benefits</li> <li>- Cookstove programs based on full subsidies hinder the development of carbon credits due to additionality</li> </ul>
Moderately Favourable	Moderately Favourable	Favourable	Moderately Favourable	Moderately Favourable

## - Implications -

***An awareness campaign, and the formation of a coordinating body at the national level that can address the lack of large scale and long term sustainable cookstove programs is needed.***

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# Case Study A: Túumben K'óoben Stove Program

- **Organisation:** U'yo'olche
- **Region:** Felipe Carrillo Puerto, Quintana Roo
- **Stove:** Túumben K'óoben
  - Adapted Patsari model with local materials
  - 40cm diameter for each of the two comales, chimney, sits on base
- **Price:** \$1500-\$2150 pesos (\$115-\$165 USD)
- **Funding:**
  - Subsidies- Federal government and international organisations: Fondo Canada, Conafor, Comisión Nacional de Areas Naturales Protegidas
  - Microcredit- Fondo Canada
- **Stoves Distributed:** ~1,000
- **Best Practices:**
  - Demonstrated stove by cooking stew for everyone "Matam" (Mayan word) - a tradition done in the Mayan communities
  - Recruited women to work as promoters, and gave them free stoves
  - Continually adapts stoves for preferences (height, shelves, decorations, water heater, etc.)
  - Family values stoves because they must contribute the foundation base



# Case Study B:

## Stove Team International Stove Program

- **Organisation:** Stove Team International, Rotary International, Apoyo a Gente Emprendedore A.C.
- **Region:** Clavellinas (outside San Miguel Allende, state of Guanajuato)
- **Stove:** Ecocina
- **Price:** \$500 pesos, \$38 USD
- **Funding:**
  - Rotary International
  - “Tanda” system - everyone pays once a month to a common fund and they raffle a stove each month
  - Each family pays for stove in 10 weekly installments of \$50 pesos
- **Stoves Distributed:** Factory has only been operational for 4 months. 1050 stoves have been sold.
- **Best Practices:**
  - Ecocinas have a metal “skirt” surrounding the pot to keep the heat
  - Works with local women promoters who help collect the payments
  - Comale spacer allows for interchangeable comales
  - Stove factory owner was identified from the community and takes active participation in community involvement



# Case Study C: SAGARPA Stove Program

- **Organisation:** The Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food
- **Region:** Based in Mexico City, operates across the country. SAGARPA is present in 850 municipalities, serving 900,000 people (more than 180,000 families)
- **Stove:** 80% PATSARI and 20% LORENA
- **Price:** \$4000 pesos (including training), \$307 USD
- **Funding:**
  - Federal Government
- **Stoves Distributed:** SAGARPA has agreed to distribute 100,000 cookstoves by the end of 2012 as part of the Federal PECC program - 46,068 installed to date
- **Best Practices:**
  - Wide network of implementation agencies (government, NGOs, commercial, etc)
  - Focus on women-headed households since many men migrate to the big cities or US
  - Families pay 10% of value of the stove (in cash or time), which grants a sense of ownership
  - Employs technical team to train the families on stove usage



# Glossary of Terms

**Below is a list of commonly used acronyms used throughout the report and presentation:**

CDM – Kyoto Clean Development Mechanism

CO<sub>2</sub> - Carbon dioxide

CONAFOR – National Forestry Council

CONAPO – National Population Council

DNA – Designated National Authority

EU – European Union

GACC – Global Alliance for Clean Cookstoves

GDP – Gross Domestic Product

HH – Household(s)

IAP – Indoor Air Pollution

IBS – Improved Biomass Stove

ICS – Improved Cookstove

iNGO – International Non-Governmental Organization

INMUJERES – National Women's Institute

LDCs – Least Developed Countries

LPG – Liquid Petroleum Gas

NGO – Non-Governmental Organization

OPORTUNIDADES – Government program that provides subsidies to the poorest households

PAR – Rural Supply Program

PECC – Special Climate Change Program

PESA – Strategic Project for Food Security

PDZP - Program for the Development of Priority Zones

POA – Program of Activities

SAGARPA - Agriculture, Livestock, Rural Development, Fisheries and Food Secretariat

SEDESOL – Social Development Secretariat

SEMARNAT – Environment and Natural Resources Secretariat

UN – United Nations

ZAP – Priority Action Zones