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Global Alliance for Clean Cookstoves

Peru Market Assessment

Sector Mapping

Accenture Development Partnerships

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). The information in this assessment is accurate as of 2012 when this study was conducted.
- 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 eighteen such assessments (as of December 2013) 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, Guatemala, India, 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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Peru Sector Mapping (1 of 2)

34%¹ of Peruvian households currently cook with kerosene or solid fuels without a chimney, and suffer from indoor air pollution (IAP). The World Health Organization estimates that 1,500² deaths are a result of this.

While the focus is now on the health benefits of improved cookstoves (ICS), the original driver was deforestation. 60% of Peru is covered by rainforest – roughly 20% of the Amazon. Although slash and burn farming remains the major threat in the region, ICS is seen as an additional method of addressing deforestation. Peru aims to completely halt deforestation, which globally accounts for 18% of carbon emissions, by 2018 with international funding.

The government and a handful of NGOs began implementing ICS initiatives in the 80s, although the realities with regard to stove efficiency are unclear. *CentroECO* was one of the first NGOs to undertake a systematic approach to the issue of household cooking practices, and implemented the ‘*Healthy Kitchens*’ and ‘*Healthy Homes*’ projects in 1996 and 1999 respectively in partnership with *Winrock* and *USAID*. They took a holistic approach to the sector using a comprehensive pilot to understand which stoves were likely to be successful and offered sufficient efficiency improvements. They also addressed the issues of ‘stove ownership’ and micro financing through innovative bartering schemes.

Several initiatives built on this, but momentum was slow until 2007 when the First Lady Pilar Nores de García helped establish the “*Instituto Trabajo Y Familia*” (*ITYF*), which launched the “*Sembrando*” project. This project has distributed over 90,000 stoves to date, and in 2011 it received carbon credits under the “*Qori Q'oncha*” PoA. *Microsol* began developing this PoA in 2008, enabling rural communities to benefit from carbon financing by reducing the barriers for implementers.

In 2009, *GIZ* and *ITYF* launched the “*Medio millón de cocinas mejoradas por un Perú sin humo*” campaign with the aim of raising awareness of the benefits of ICS within the central government. The campaign carried out research regarding the health implications of IAP and successfully raised the profile of the numerous NGO projects in progress in 2009. The campaign also established the need for an independent stove testing facility which could ensure improved cookstoves were of a suitable standard. As a result, *GIZ* worked with the government to fund the *SENCICO* testing facility.

The Ministry of Energy and Mining (*MINEM*) launched “*Project Nina*” (Oct. 2009 – Dec. 2011) and successfully distributed 40,000+ Liquefied Petroleum **Gas** (LPG) stoves and 64,000+ improved wood burning stoves to rural communities. While the long term strategy is focused on LPG, the government remains very supportive of improved wood burning stoves for the immediate future.

The market remains dominated by NGO and government initiatives, which are reaching a large number of households (currently over 225,000), but the private sector is less well established.

Sector Mapping (2/2)

	Findings
<i>Social and Environmental Impact</i>	Income inequality is a key concern within Peru; the government is focusing on addressing the issue, but indoor air pollution still disproportionately affects the poorest in rural communities. ICS could have a profound impact on rural communities, both in terms of health and household economics. Some households have started to use the time saved through ICS use to produce artisanal products that can be sold as a source of secondary income. Due to Peru's vulnerability to climate change, deforestation is also a key driver and as such, the government is strongly pursuing increased LPG use.
<i>Consumers</i>	Most initiatives are focused on the 0.4 million rural and 0.1 million urban households currently living in extreme poverty (less than 1.7 USD/day). The poorest regions are often the most inaccessible, with the Andean region being the most impacted due to poor infrastructure and wood scarcity combined with the low pressure and temperature due to the high altitude. These households lack access to capital and are often isolated.
<i>Cookstove Industry</i>	The sector is very well developed with large NGO and government projects dominating the market. There is a government testing facility which manages stove certification and several academic institutes are providing support across the sector. The <i>Cocina Mejoradas</i> campaign successfully completed key research, tracked progress and raised awareness of IAP, as well as fostering a collaborative environment.
<i>Carbon Financing</i>	The <i>Qori Q'oncha PoA</i> works with 90% of cookstove implementers and has greatly increased accessibility to carbon credits. The first credits were awarded to Sembrando in 2011, and although progress is being made the PoA is still in its infancy.

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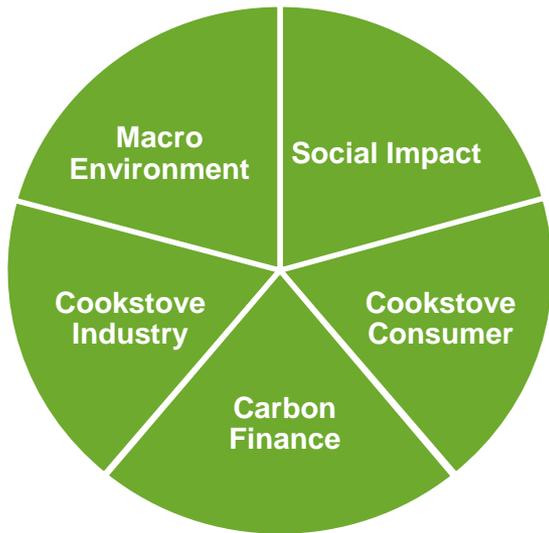
Sector Mapping Summary

Appendix

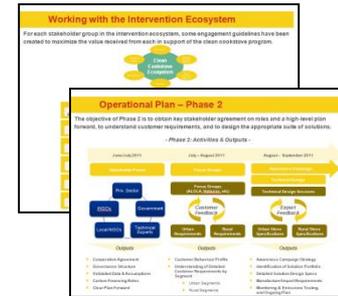
Project Approach

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

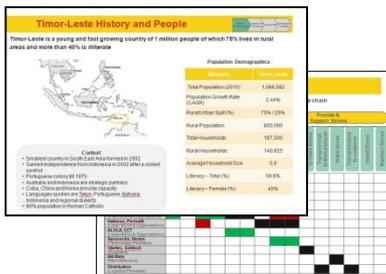
← Sector Mapping →



← Strategy Development →



Intervention Options And Relative Roadmap



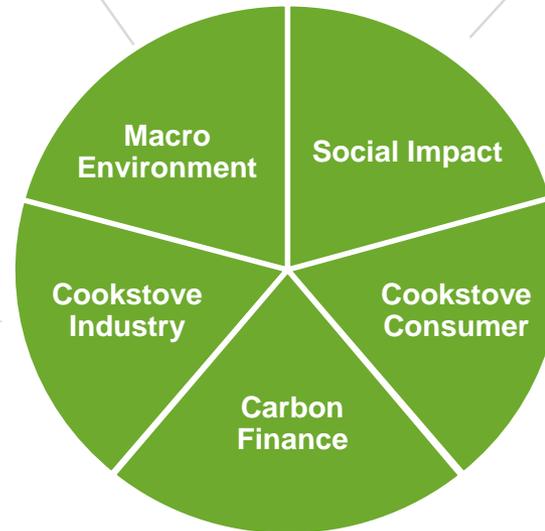
Sector Map

Sector Mapping Approach

Sector Mapping of the cookstove sector was conducted across five dimensions.

- *Social:* What are the country demographics & population distribution across regions?
- *Political:* How stable is government & what political risks will any program face?
- *Economic:* How much money do 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 programs?
- *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 programs?
- How commercially attractive is the sector & what are likely to be some of the industry challenges?



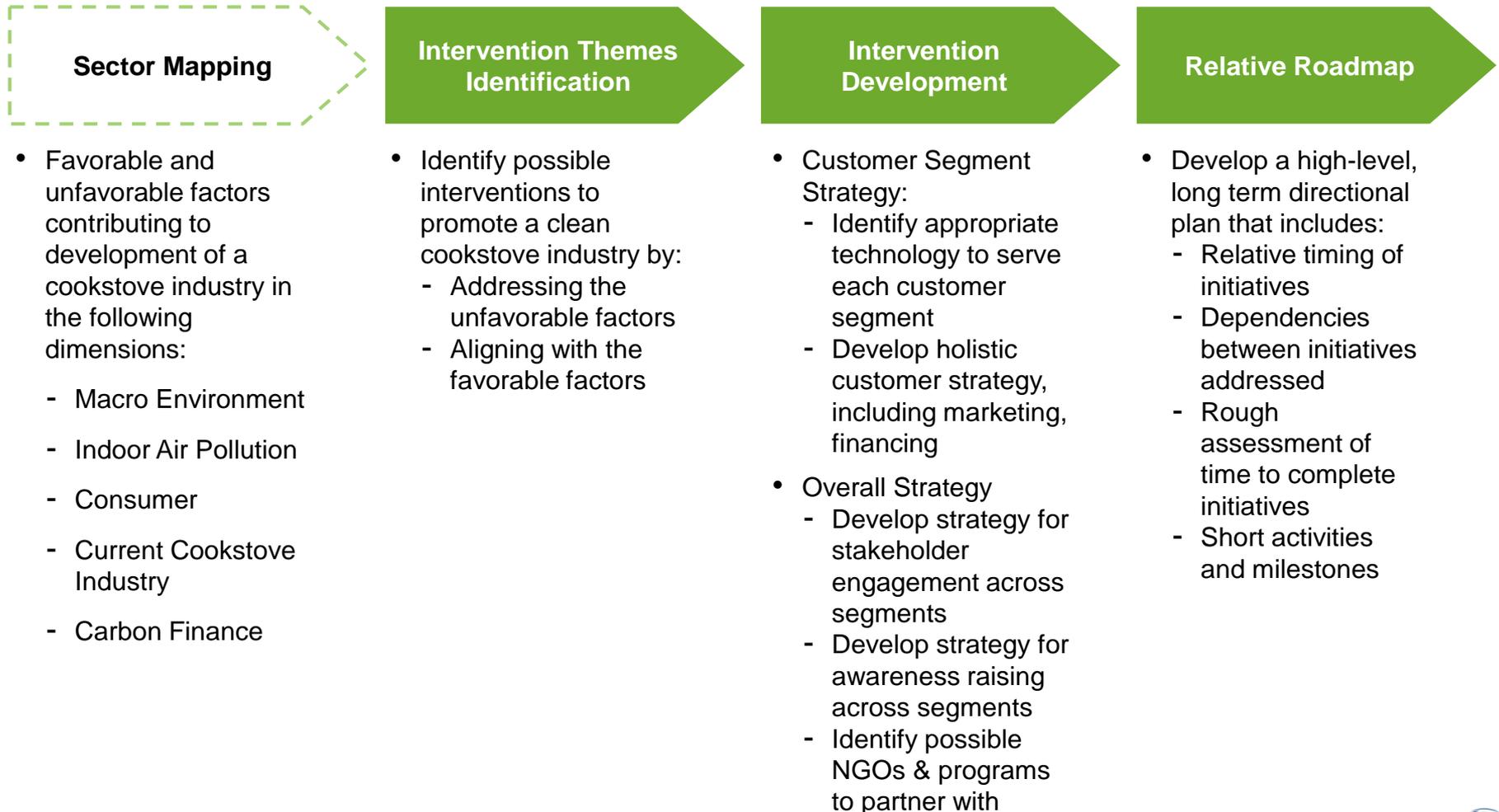
- What carbon financing options exist for the country?
- What structures exist that can be leveraged for future carbon financing components?
- Which entities are likely to fill the required roles in the carbon finance operating model?

- How do people cook and what fuels are used in the region?
- What is the current IAP exposure profile of the target market? (Primary cause of IAP and size of problem)
- What are the other impacts caused by the use of open fires or traditional stoves?
- How do cookstoves compare to 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 Peru and experience in cookstove initiatives.



Instituto Trabajo y
Familia



UNIVERSIDAD CATÓLICA
SANTO TORIBIO DE MOGROVEJO
Chiclayo - Perú



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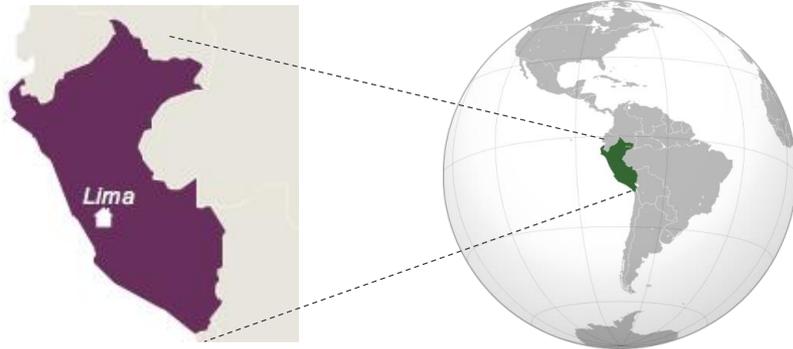
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Social Environment

Peru experienced an economic boom in the 2000s, mainly due to the extractive industries, but there is still 34.8% of the population living below the poverty line with a large percentage in rural areas.



Context

- Peru was granted independence from Spain on July 28 1821
- The population consists of two large ethnic groups – 45% Amerindian, 37% Mestizo (mixed Amerindian and white)
- Official languages: Spanish (84.1%) and Quechua (13%); there are a large number of native languages, the most commonly spoken are Aymara (1.7%) and Ashaninka (0.3%)
- Religion is split between Roman Catholic 81.3%, Evangelical 12.5%, other/unspecified/none 6.2%
- Peru ranked 81/187 countries in the 2011 Human Development Index (HDI)

Population Demographic *July 2012 estimate	Peru
Total Population*	29,549,517
Population Growth Rate*	1.016%
Rural/Urban Split (2010)	23% / 77%
Rural Population (2010)	6,796,389
Total Households (2007 Census)	7,566,142
Average Household Size	3.9
Literacy – Total*	92.9%
Literacy – Female (2007 census)	89.4%
Life Expectancy*	72.73 years
Population below poverty line (2009)	34.8%

“We can change a lot more things in poor countries than when you help a country like Peru, with a mid-level income, which has resources to exploit and that could be as rich as a European country.”
– Bill Gates

- Implications -

The outlook for cookstove interventions that address vulnerable populations living below the poverty line is positive, as funding will likely not be the biggest issue.

Administration and Governance

In 2002 Peru initiated the process of decentralizing administration to improve governance through the creation of politically and economically autonomous regions, but this is still in progress.



Administrative Map

- The country is divided into 24 departments or regions and one constitutional province (Callao). Each department has provinces, each province has districts, and each district has communities and community annexes (smaller than communities).
- 8,769 million people live in the capital city, Lima; the second largest city, Arequipa only has 778,000 inhabitants.
- Peru houses three very distinct regions, with unique geographies, lifestyles etc. – Western coastal plains, highlands in the Andes (center) and the Eastern lowland jungle of the Amazon Basin.

Governance

- Every four years, each region elects a government composed of a president and council who plan regional development, execute public investment projects, promote economic activities, and manage public property – with the exception of the province of Lima, which is administered by a city council.

"...the Team concludes that democracy and good governance in Peru are seriously hindered in the short run by the lack of effective checks and balances on the exercise of Executive power..." -MSI 2000

-Implications –

Large government projects are managed at the country, regional and local levels. This has benefits for the cookstove sector e.g. funding, but can also lead to inefficiencies.

Peru has an intricate political history, with several presidents leaving office under atypical circumstances. The current government is aiming to eradicate corruption, but this is a long process.

Political Structure

- A presidential, constitutional republic (multi-party system)
- The President (elected every five years) is the head of state and government and can only seek re-election after standing down for at least one full term
- Voting is compulsory for all citizens aged 18 to 70

Working with the Government

- There is an ongoing international debate about the level of support middle income countries should receive
- Corruption remains an issue despite the creation of the anti-corruption commission in 2010. In Oct 2011, President Humala replaced 30/45 top police officers, and Omar Chehade (1 of Peru's two Vice presidents) resigned in 2012
- Programs that require a long-term vision are challenged by the lack of continuity of policy with each government change

Current Government

- In 2011, Ollanta Humala of the Gana Perú alliance was elected president (51% votes)
- Ollanta Humala (a career army officer) entered power on the basis of democratic leadership and social equality. Originally viewed as an ally of Hugo Chavez, his election caused a temporary downturn in global markets
- Humala stated that Peru's poor are his top priority
- Humala changed the legislature to enable public money to be spent on initiatives which impact private property e.g. water purification, ICS
- Difficult relationship with the Inter-American Commission on Human Rights since the commission's scope grew to include environmental and indigenous rights

"Physical attacks on journalists are frequent and are compounded by "acts of censorship and intimidation" by the government"
- RSF World Report, 2010

- Implications -

Although the government is active in the cookstove sector, previous projects have been impacted by lack of continuity between consecutive governments.

Economic Environment

Peru is an upper middle income country with an economy growing by 6.4% per year since 2002, although in 2011 it rose to 7% due in part to a leap in private investment. Between 2000-2010, Peru was the fastest growing South American economy and cut poverty from 50% to 34%.

Key Economic Indicator	* denotes 2011 est.
GDP	\$299.7 billion*
GDP Per Capita (PPP)	\$10,000*
Economic Growth Rate	6.2%*
Inflation Rate	3%*
Unemployment <i>(Note: Only includes the Lima metropolitan area - thought to be much higher at the national level)</i>	6.8%* <i>(Masks a high rate of underemployment)</i>
Youth Unemployment (2008)	14%

Key Economic Indicator	
Exports (2011 est.)	\$43.83 billion: copper, gold, lead, zinc, tin, iron ore; petroleum and natural gas; coffee, textiles and fishmeal <i>Major markets:</i> China, Switzerland, US, Canada, Japan, Germany
Imports (2011 est.)	\$36.85 billion (\$28.82 billion in 2010): petroleum products, chemicals, plastics, machinery, vehicles, telecoms equipment <i>Major suppliers:</i> US, China, Brazil, Ecuador, Argentina
GDP composition (2010 est.)	Agriculture: 10% (0.7% 2005 labour force) Industry: 35% (23.8% 2005 labour force) Services: 55% (75.5% of 2005 labour force)

60% in the extractive sector

In Lima, 56% of residents can now afford...leisure activities and (to) spend on personal needs. But in rural areas, where only 2% of the population belongs to the middle class, 84% of people can only afford to buy food.

– Recent newspaper [article](#) commenting on the **inequality** in Peru

- Implications -

While Peru's economy is growing at an impressive rate, infrastructure is unreliable away from coastal areas and the poverty rate is far higher. ICS programs focusing on these deprived areas could have a large impact.

A Commodities Economy

Peru's economy is heavily dependent on commodities, primarily driven by the coffee and extractive industries. The extractive industry alone accounts for more than 60% of exports.

Background

- In 2008, mining accounted for over 70% of exports, but only 6% of GDP
- The only Latin American company to join the Extractive Industries Transparency Initiative (finalized 2012)
- Peru appears to be avoiding the 'Resources Curse' (adhering to many of the World Bank guidelines), focusing heavily on development while improving transparency.

Issues

- The recent growth in the value of commodities has allowed Peru to develop quickly, but the sector is extremely volatile.
- The extractive industries have a history of producing a small number of jobs (especially for the local population)
- Property rights disputes – land ownership is private, but the government has full rights to the resources below (e.g. minerals, oil, gas) and above ground (e.g. water, wood)
- Unregulated gold mining remains an issue (socially and environmentally) employing an estimated 50,000 Peruvians

Income from Extractive Industries

- The government of Peru collects special income taxes and rights to extraction fees from the mining and oil industries (non-renewable resources), and then distributes 50% of what it collects to the regional and local governments (this is called "canon, sobre canon & regalía minera")
- Although this amounts to billions of dollars, due to current laws, the government is not allowed to spend it on private property, which includes cookstoves
- Encouraged by the campaign "Cocinas mejoradas por un país sin humo" **a law is now in discussion in parliament to allow the use of up to 10% of these funds on cookstoves, water systems and latrines** (see page 40 for more details)

"47% of social conflict in the country in 2009 concerned environmental and land disputes related to the extraction industry"

- Peru's national ombudsman's office

- Implications -

Although the potential new law would channel a significant amount of funds towards cookstove programs since the economy is strong, this is vulnerable to market forces (many of which are external), hence the funding may not be available in the immediate future.

Gender equality is being addressed by both the government and NGOs, but issues remain especially with regard to the physical integrity of women. Men typically control the household finances.

Policy, Government, and Institutional Frameworks for Gender Issues

- 2002: Gender discrimination criminalized. Constitution upholds equality
- Law mandates that at least 30% of candidates on the party lists are women, but they're rarely given prominent roles
- 1996: Ministry of Women and Vulnerable People (MIMP) established
- However, there is a gap between the policy and practice e.g. a recent survey stated that just under 50% of women living in a couple relationship has experienced violence at least once

Key Gender Issues in the Country

- Peru ranks 72/146 countries in the 2011 Gender Inequality Index (UNDP)
- 2001: National Programme against Family Violence and Sexual Abuse was established but gender based violence remains an issue

"Insensitivity on the part of law enforcement and judicial authorities toward female victims contributed to a societal attitude of permissiveness toward abuse"

– US Department of State, Bureau Of Democracy, Human Rights, And Labor (2011)

- Implications -

Gender inequality is being addressed at a high level, but NGOs rarely include gender in ICS projects – not viewed as a high priority due to cost. Potential to improve gender focus.

Gender Equality Statistics

* Denotes 2005-2010

	Male	Female
Primary school net attendance ratio*	96%	96%
Secondary school net attendance ratio*	74%	73%
Tertiary school attendance <small>(Gross National enrolment 2002)</small>	31%	33%
Youth (15-24 yrs) literacy rate* <small>Adult lit. rate* = 90%</small>	98%	97%
Relative % of women in parliament (2011)	72.5%	27.5%

Income Inequality

While extreme poverty has been reduced, there remains considerable inequality, with rural communities (especially indigenous groups) often suffering most.

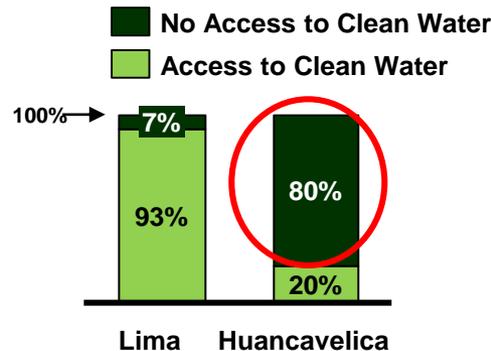
Inequality within Peru

- The Peruvian census does not collect data on ethnicity, so while the indigenous population is said to be between 30-45%, there is limited information at a more granular level. Peru is believed to have the 3rd largest number of uncontacted tribes in the world
- The inequality is most pronounced between Lima and the Amazon Basin/Andean Highlands

Example: Huancavelica Region

Doctors per 10,000 people

Lima & Arequipa	26
WHO Recommends	16.6
Huancavelica	5.7



Policy, government, and institutional frameworks for equality issues

- The government is addressing inequality, but progress is slowed by the expense as a result of the size of the country and dispersed population
- The current administration campaigned on and champions the rights of indigenous and disenfranchised groups
- 2007: The Government created the 'Native People' Department within the Ministry of Women and Vulnerable People
- AIDSEP is the largest national indigenous rights organization

"A girl that lives in the rural highlands of the country is four times more likely to be poor and three times more likely to not finish secondary school compared to a girl born in Lima"

- UN representative Rebeca Aria, 2010

"760,000 people in Peru still do not have identification from the government, such as a birth certificate. This prevents those residents from accessing education, health care, and government assistance programs."

- UNDP, 2010

- Implications -

While there have been many ICS initiatives to date, there are still numerous communities that have not been addressed. This includes remote and uncontacted indigenous groups, which will require a special approach if addressed.

Peru is a leader in many areas of infrastructure in Latin America. However, Peru has the highest infant mortality rate and second weakest education system in the region.

Current Situation

Government Priorities

	Health Care	Education	Energy	Transportation	Telecommunication
Current Situation	<ul style="list-style-type: none"> Public healthcare system for the poorest Highest infant mortality rate in Latin America (28.75/1000)¹ The expansive jungle region results in cases of Dengue fever, Yellow fever etc. Most of the hospitals and medical facilities are concentrated in Lima 82% access to drinking water 	<ul style="list-style-type: none"> 92.9% literacy rate (2007) Education is free and compulsory at initial, primary and secondary levels University education is free for those with high grades but limited funds 73% secondary net enrolment rate (2009) - higher for girls 	<ul style="list-style-type: none"> 89% electricity access; Latin America ave: 93% 66% of rural households have access to grid energy – 18% of other households use batteries Energy production split: thermal & hydroelectric FOSE tariff ensures electricity is affordable for rural areas 	<ul style="list-style-type: none"> Very good road/rail network in the coastal area Adequate road networks even in difficult terrain, rural areas remain the least developed Largest airport is in Lima, with >95% of international flights 41 motor vehicles per 100 people 	<ul style="list-style-type: none"> In 2009, 85% of the population had a mobile phone subscription (5% in 2000) – to fight fraud, all sims are registered Households with TVs increased from 1% to 73% between 2000-2009 10% have access to a personal computer, but public access is readily available
Government Priorities	<ul style="list-style-type: none"> Aiming to decentralize the healthcare system Child malnutrition 	<ul style="list-style-type: none"> Addressing indigenous communities 	<ul style="list-style-type: none"> 93% electricity access by 2015 Move towards gas-powered energy 		

- Implications -

Peru is developing at a fast rate and investing in the country's infrastructure, which should benefit cookstove dissemination.

Ecological Environment

The 3 regions of Peru (coastal, highlands and rainforest), create unique environmental challenges and have implications for cooking habits and cookstove use.



Source:
<http://www.southwindadventures.com/images/map-peru.jpg>

Climate

- Due to the size of Peru, climate varies greatly, but broadly speaking the country is determined by regions: the rainforest is generally tropical, with high temperatures and heavy rainfall; the coastal region experiences moderate temperatures, low precipitation and high humidity; the highlands receive frequent rain in summer, but very low temperatures/humidity at high altitude

Environmental Issues

- Rainforest deforestation is a major issue due to illegal logging and migrants settling illegally in protected areas
- Peru is a UN-REDD partner country, although there are concerns about the social implications of the reforestation projects
- Overgrazing, deforestation and increased rainfall in recent years has resulted in increased soil erosion
- Desertification; air pollution in Lima; and industrial and municipal pollution of rivers and coastal waters remain key issues

- Implications -

Environmental protection is recognized as an area for improvement and ICS initiatives should capitalize on this momentum.

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Although differences exist by region and income level, cooking habits across Peru have a relatively uniform list of requirements for improved cookstoves.

Type of Food



- The Peruvian diet is diverse, but it consists primarily of rice (widely available below 4000m), "Mote" (corn), potato, wheat and soups
- Meat is eaten once a week and on special occasions, typically (guinea pigs, chicken, pork)
- Main dishes ("Segundos") of potato, wheat, corn typically take less than half hour to prepare
- In cities, baked goods are popular (empanadas, breads, deserts), but are rarely cooked at home
- *Regional foods:*
 - *Coast* – Fish/seafood is readily available
 - *Highlands* – Guinea pig is popular and is encouraged by NGOs as a source of protein (especially for pregnant women and young children)
 - *Rainforest* – Beans/plantains (indigenous), rice (migrants), river fish. Occasionally smoke food

Cooking Habits



- Women tend to perform the majority of cooking
- Cooking habits make a minimum of two burners essential for most communities
- Cooking usually takes place indoors, with less enclosed homes in the rainforest
- Various pot sizes are used (very large ones for festivities and workers returning at the weekend)
- In peri-urban areas many people have LPG stoves but only use them for rice due to cost of gas and concerns regarding the speed of cooking
- Electricity is generally not used for cooking
- A government initiative to provide milk to all children under five years old ("vaso de leche") requires fresh milk to be boiled. This is generally done at community "clubs" on institutional stoves

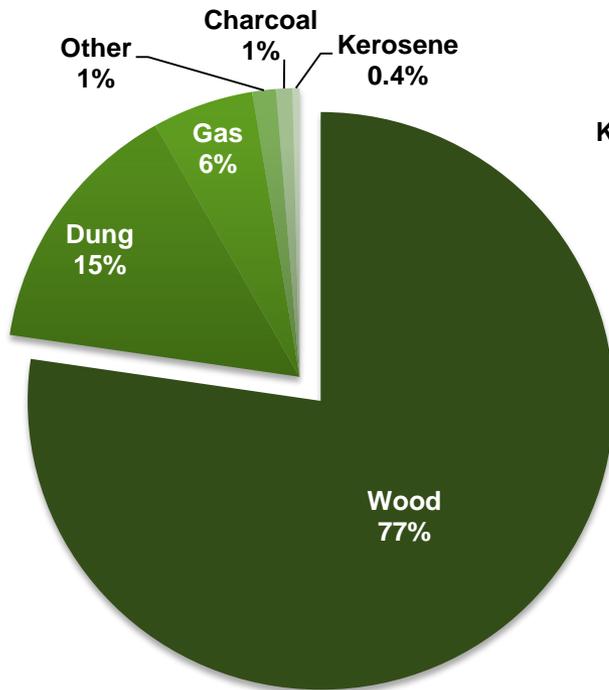
- Implications -

Cookstove designs must have a minimum of two burners, accommodate pots of different sizes, and satisfy women users. Household ovens are not often required due to diet and cooking habits.

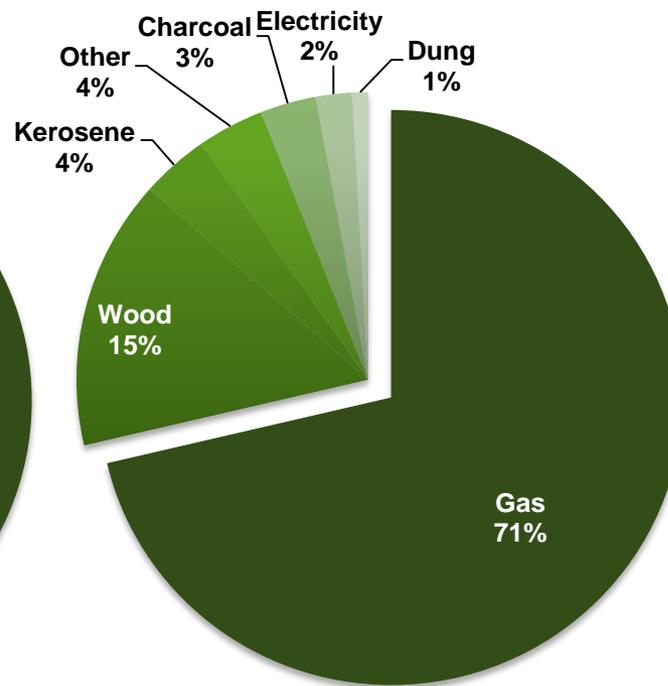
Fuel Usage & Availability

Wood is the dominant household cooking fuel in rural Peru, and dung is mostly used in high altitudes where wood is scarce. In urban areas, gas is the most prevalent fuel, followed by wood.

Total Rural Fuel Use



Total Urban Fuel Use



Fuel use & availability

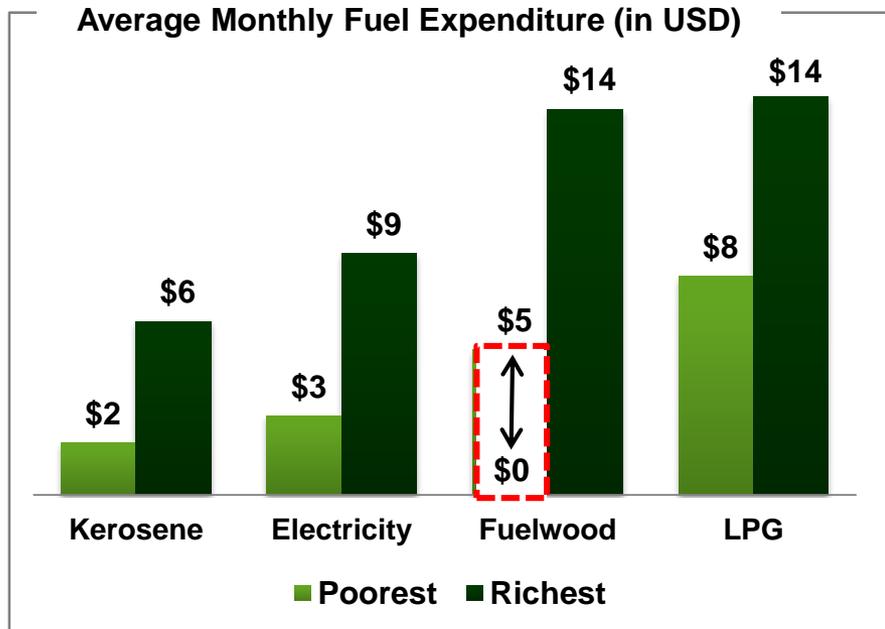
- Although gas is produced in Peru, most is exported, and the rest is distributed mostly in Lima and other coastal regions like La Libertad, Arequipa and Callao
- 88% of the households have access to electricity, but this is only used for cooking by 2% of the urban population and none of the rural population
- Rural communities that use dung are located at high altitudes above 3,000m where trees are scarce

- Implications -

Due to the high price of gas in rural areas, the primary alternative for traditional wood and dung fuel users is improved wood burning cookstoves. In the cities, gas can be an alternative fuel as prices are slightly lower.

Available Fuel Cost

Most fuelwood users in rural areas collect wood at no direct cost, which explains their selection of wood over LPG. The cost of LPG is higher in areas where it is produced (Cusco), than in areas along the coast where it is bottled (Lima).



Observations

- Electricity is not used for cooking in rural Peru due to the historic lack of access to the grid. Even as the grid is expanded, electricity is not used for cooking
- Household expenditures on kerosene, fuelwood, LPG, and electricity are much higher along the coast than in the highlands and the Amazon

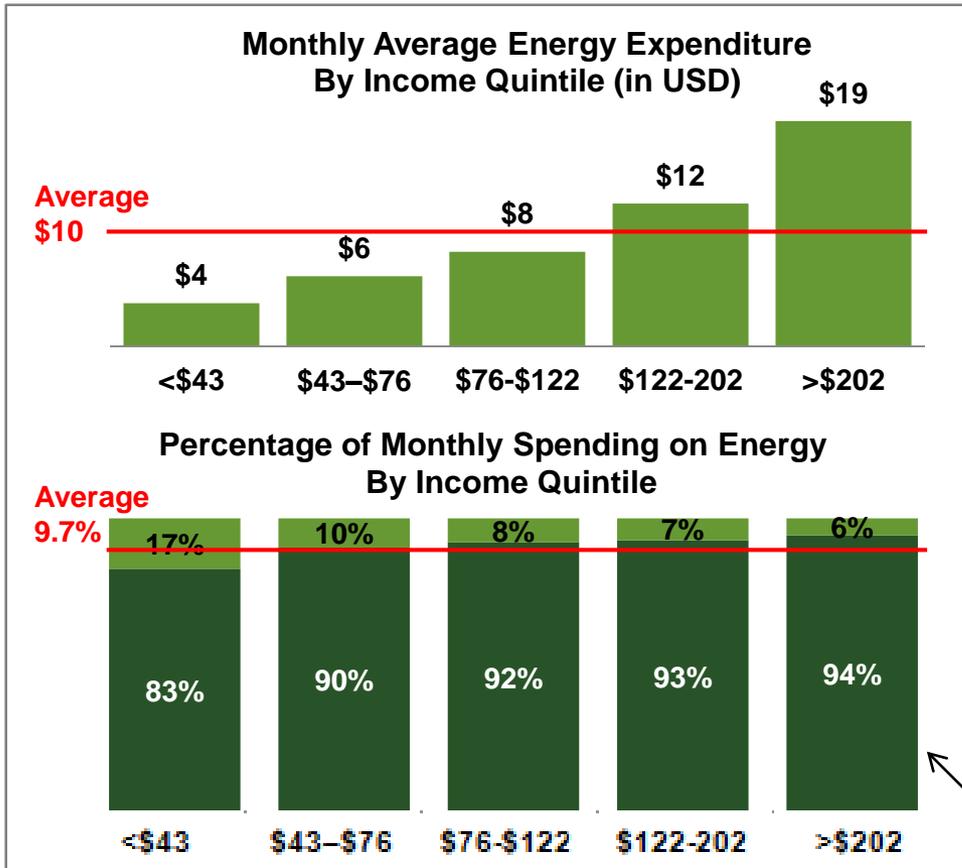
“The multi-million “canon” (special tax) from the gas extracting industry continues to be only a number for the people in the extracting regions and their authorities, on which little has been invested to improve their execution skills. It is a pity that this multi-million activity continues without giving a better quality of life for the people in the areas impacted. - Maria Luisa del Rio, El Comercio, April 2012

“We are the owners of the gas and also the ones that pay the most. The communities have to pay 70 soles for a bottle of gas”.
- Trotsky Fernando Guzman, Valle de Kepashiato, Cusco (quoted by Maria Luisa del Rio in El Comercio, April 2012)

- Implications -

As long as biomass is available at no direct cost and LPG prices remain high in rural areas, there will be minimal adoption of LPG or electricity as fuel for cooking .

Inequalities in Peru are also reflected in the use of energy, as households without electricity spend almost the same as households with electricity for lower quality substitutes.



Observations

- Energy expenditures for households living in the Coastal Central and South regions are about 2.5 times higher than those for households living in the three Andean and the Amazon regions
- Energy expenditure represents a heavier burden for households in the three Andean regions than for households in all other regions of the country
- Rural households without electricity rely on traditional fuels such as candles and kerosene for lighting. Among the 1.3 million rural households without electricity 80% use kerosene
- Households without electricity access spend almost the same as households with electricity for electricity substitutes

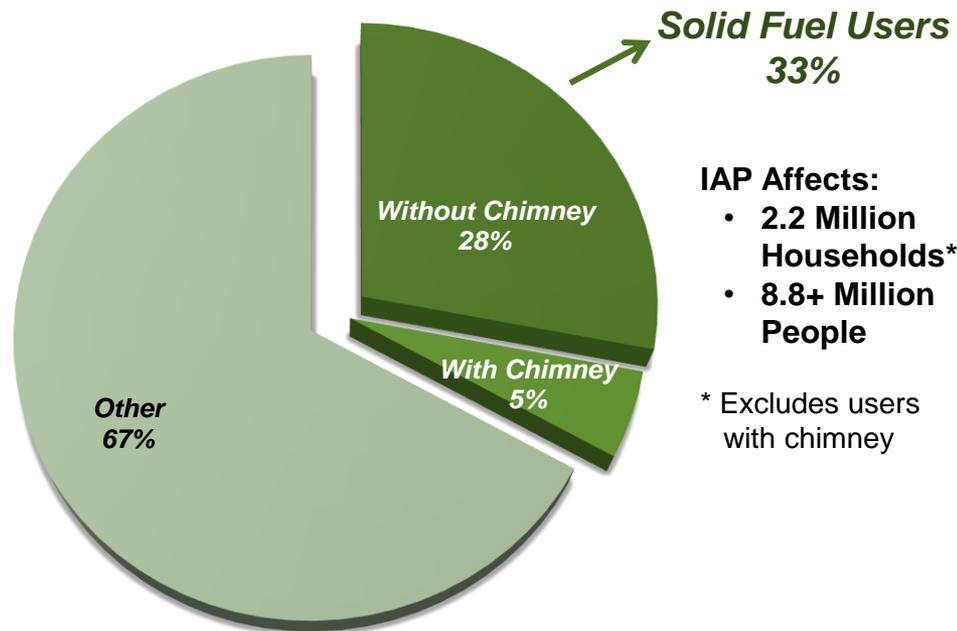
- Implications -

Cookstove interventions need to consider the fact that the lowest income segments either do not have access to clean fuels (e.g. electricity) or cannot afford it (e.g. LPG).

Indoor Air Pollution (IAP) in Peru

Indoor air pollution due to solid fuel use is alarming in Peru. At least 28% of the population uses a cookstove without a chimney, which results in an estimated 1,500 premature deaths per year.

How Many People are Impacted?



IAP Affects:

- 2.2 Million Households*
- 8.8+ Million People

* Excludes users with chimney

What are the Health Impacts?

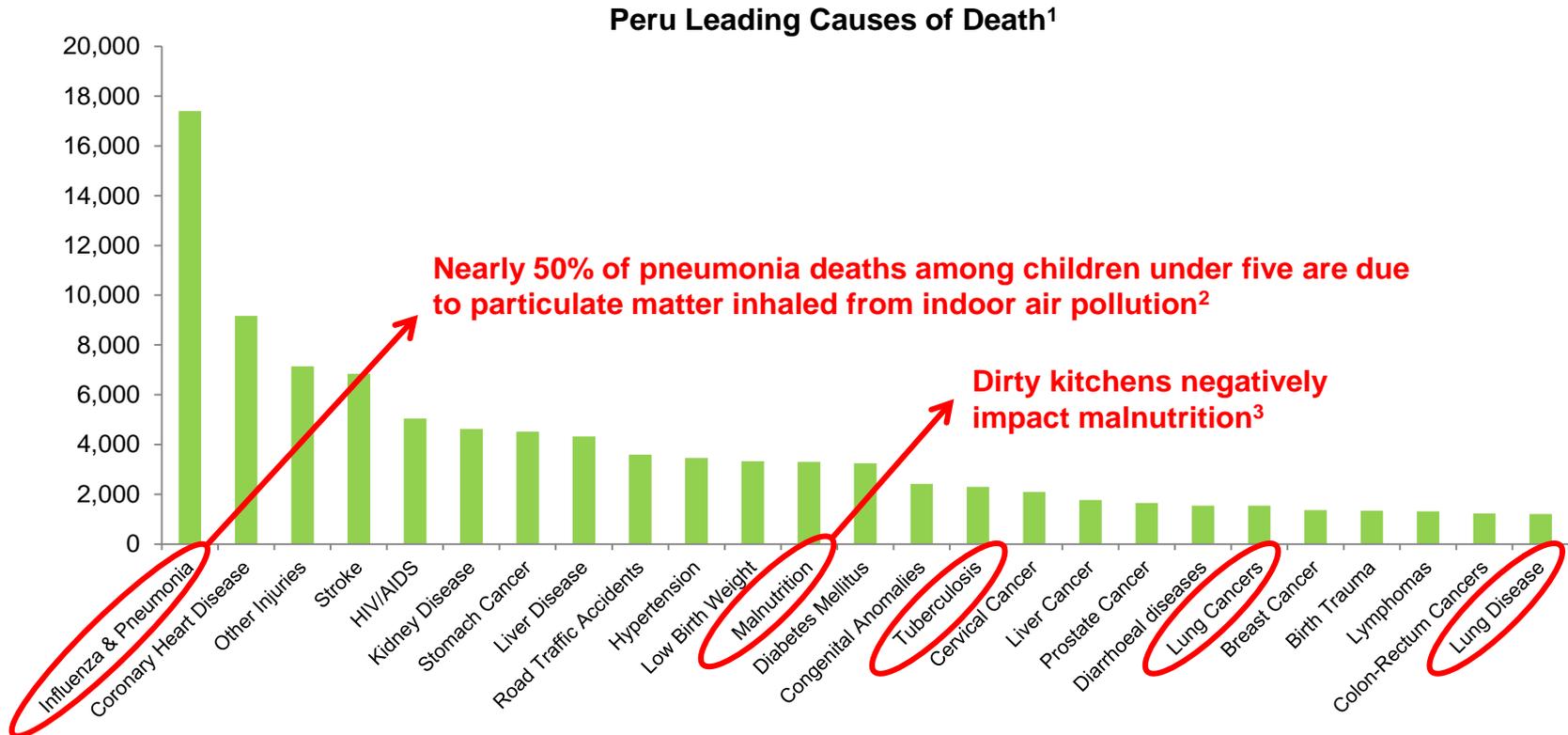
- 1,500 deaths per year due to indoor air pollution
- 47,900 total DALYs due to solid fuel use
- 0.9% of national burden of disease attributable to solid fuel use

- Implications -

Although the campaign '500,000 Cocinas Mejoradas Por Un País Sin Humo' has put this serious issue on the government's agenda, there is still a long way to go to address the remaining households.

Indoor Air Pollution vs. Other Priorities

Pneumonia and malnutrition are top government priorities and are linked to IAP.



- Implications -

Raising awareness of the impacts of smoke from cooking on child pneumonia and malnutrition can draw attention to IAP as one of the main causes of child deaths in the country.

Commodity Market Impact

Social and Environmental Impact

Through community projects, mining companies are a key source of funding for social programs, including cookstove initiatives. Due to new changes in law, this contribution is expected to increase.

Mining

- Several large, typically NGO, initiatives receive private funding from the mining industry. This source of finance is very beneficial, but is not without issue (see quote)
- Previously, the government could only spend money on public initiatives, unable to fund improvements to private property (including households). This year a law is being discussed to enable funds to be used for purchase of private items (e.g. improved cookstoves and latrines)

“Mining companies often provide considerable financing for projects to improve livelihoods. However, some communities (especially those in close proximity to the mine) refuse to accept any funding from the companies and in some extreme cases, refuse to cooperative with any NGOs which appear to work with the mines”

- International NGO based in Lima

Coffee cooperatives

- Many coffee producers form cooperatives to help regulate prices
- Coffee producers can demand higher prices for certified organic coffee than for their standard produce. However, in order to obtain the certification, the living quarters of the growers must fulfil certain criteria, such as a clean kitchen
- GIZ, the NGO that leads the “500,000 Cocinas Mejoradas” campaign, is encouraging independent improved stove masons/entrepreneurs to use coffee cooperatives as a way to introduce their stoves to a larger pool of potential clients (their members) through demos and presentations during their collective events
- Working with the cooperatives is mutually beneficial as the coffee growers receive financial recompense for the stove through increased income

- Implications -

There are exciting opportunities to work with cooperatives and companies, but these partnerships can also be sensitive.

Rainforest degradation is a major concern globally, with the primary cause being “slash and burn” farming and not inefficient cookstoves.

Deforestation

- Deforestation is a major issue in the rainforest due to the slash and burn farming, which consists of the following:
 - Parcels of virgin rainforest are cut down, burnt before crops are planted
 - This results in very fertile land the first year, but on subsequent years the land loses all nutrients so the farmers leave it and move to a new piece of virgin rainforest
 - This practice is illegal but it is very difficult to police
 - The areas where this is happening are reservation areas
- Inefficient cookstoves contribute to deforestation, but to date this is only a secondary cause after slash and burn farming in the rainforest (projections indicate that this will change)
- To fight deforestation, the municipality of Jepelacio in the San Martin region (rainforest) is planning to plant bamboo as an innovative way to replace deforested woods in the district

Associated Issues

- Rainforest degradation
- In some peri-urban areas trees available as firewood are already limited and families depend on wood available for purchase in nearby towns
 - Communities don't cut down fruit trees for firewood
 - Lack of trees results in water not being retained –this is especially important in the rainforest areas that suffered floods in 2012

- Implications -

Although Peru still has abundant forests, forces other than cooking needs are also impacting firewood availability. As some peri-urban communities can no longer obtain firewood at no cost, the need for more efficient cookstoves becomes imminent.

The Role of Gender

Generally speaking, women cook and collect wood in Peru, but are not the ones making purchase decisions regarding an improved cookstove.

Role of Gender in the Household

- Traditionally in Peru women don't have their own income
- In some rural communities women lack influence or decision making power
- The men control the household finances –if women want to buy a stove, men decide
- Many women in rural communities are illiterate
- Younger women are more knowledgeable about the health impacts of smoke than older women

Role of Women in the Cookstove Sector

- Women are the ones who cook and collect wood in Peru
- Some NGOs only train women through their cookstove programs, but many of the trainers are men
- Projects to improve women's homes also impacts their self esteem -Caritas has observed a change in attitudes

Barriers to further involvement

- In areas where NGOs only work with women, men resist. When the man participates the progress has been observed to be better
- People in rural communities don't normally invite people into their homes, but see speak to them at the door. In particular, a man cannot enter another house without arousing suspicion. Using women as community agents that promote the stoves has worked better for some NGOs
- To monitor wood usage, it is better to have women as surveyors –in some cases the women are the only ones that can respond to the questions

- Implications -

To ensure success of cookstove programs in Peru, it is critical to consider gender aspects and cultural differences.

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The customer segmentation in this section is an illustrative example of how the Peruvian 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 Peru
- 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 programs and regions
- Although gas is produced in Peru and is primarily used in urban households, it is assumed that most rural families cannot afford it due to lower income and additional transportation costs. However, urban households currently using traditional fuels often have gas stoves as a secondary cooking option and could switch to 100% gas with awareness campaigns and LPG promotions and incentives
- Dung users in high altitude rural areas have very limited access to alternative fuels and would benefit from improved dung burning cookstoves. However, dung users in urban areas should be able to transition to improved wood burning stoves at a minimum
- Families living in extreme poverty (less than \$1.7 USD/month/person by Peruvian standards) currently using firewood for cooking cannot afford any stove, and therefore subsidies for the improved wood burning stove materials or some form of micro-credit will be required to include them

Consumer Landscape in Peru

Economic growth has helped Peru make great strides towards reducing poverty, but economic inequality has changed minimally. In rural areas 61% of people cannot afford the basic consumer basket.

Understanding the Peruvian Consumer Landscape

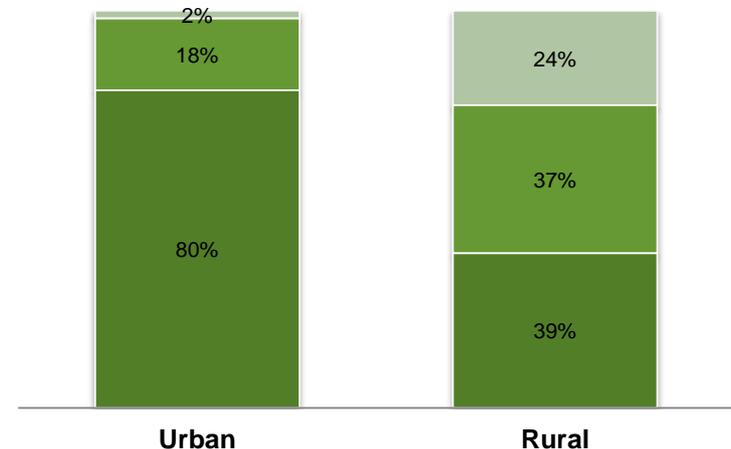
- 31% of Peruvians live with under \$100 USD per month and are considered poor by Peru's definition
- In rural areas 61% of people are poor and 24% are extremely poor, which means that they live with under \$50 USD per month
- 22% of children under five years old has chronic malnutrition, and this is currently a government priority
- 50% of rural children don't receive primary education
- Even though Peru produces gas, the price of gas is too high for the poorest to afford it

Region	Total Population	Population Living in Rural Areas	Percentage Living in Rural Areas
Coastal North	3,914,312	951,147	24.3
Coastal Central	1,846,606	315,465	17.1
Coastal South	713,042	173,413	24.3
Andean North	2,270,580	2,057,476	90.6
Andean Central	4,096,006	2,445,860	59.7
Andean South	3,632,728	1,885,401	51.9
Amazon	3,836,036	2,080,865	54.2
Lima Metropolitan	8,228,084	0	0
Total	28,537,394	9,909,628	

Source: INEI, Enaho 2004I, II, III and IV rounds.

65% of the country's rural population live in the Andean regions

Poverty Distribution (% of households)



- Extreme Poverty (< \$1.7 USD/day)
- Poverty (\$1.8-\$3.3 USD/day)
- No Poverty (>\$3.3 USD/day)

Note: the above poverty definition is based on the INEI's 2010 consumer basket definition, and the extreme poverty on the INEI's 2010 food basket definition, both in soles and converted to US dollars at the rate of April 2012

Sources: INEI Evolucion de la Pobreza 2012, Energy & Poverty Special Report 2010, ESMAP, World Bank

Target Market Identification

The market segments were determined by income level and access to cleaner fuels. *Of the 3 million households currently using traditional fuels, 15% use a chimney and many already have an alternative LPG stove but cannot consistently afford the fuel.*

FUEL USED TO COOK*

	FUEL USED TO COOK*				Electricity / Gas / Other	
	Kerosene	Charcoal	Dung	Wood		
Rural 1.8M Households			2 264K	3 170K		Extreme Poverty: 0.4M (< \$1.7 USD/day)
	1 7K	16K		4 656K		Poverty: 0.7M (\$1.8-\$3.3 USD/day)
				585K	126K	No Poverty: 0.7M (\$3.3+ USD/day)
Urban & Semi-Urban 5.7M Households			3 52K	57K		Extreme Poverty: 0.1M (< \$1.7 USD/day)
	1 218K	178K		4 649K		Poverty: 1.0M (\$1.8-\$3.3 USD/day)
				167K	4.4M	No Poverty: 4.6M (\$3.3+ USD/day)

Segments Identified

- 1** Can buy LPG or already has LPG as secondary
- 2** Can't buy improved dung stove
- 3** Can't buy improved wood stove
- 4** Can buy improved wood stove or LPG

-Implications -

Excluding users with a chimney, the target market for improved cookstoves in the short term is approximately 2.2M households. The rest of the traditional fuel users can be addressed through improved access to LPG in the long term.

* Many households have more than one fuel source to cook

Segment Profiles

The targeted population can be segmented into four groups: 1) Rural & urban households with LPG as secondary or only alternative & 2) Extremely poor households in high altitudes with no wood...



1 Rural/Urban using charcoal or kerosene (with LPG as secondary or only alternative)



2 Extremely Poor in High Altitude (no wood)

Size in Households	<ul style="list-style-type: none"> • 391 k (5% of population) 	<ul style="list-style-type: none"> • 268 k (4% of population)
Profession	<ul style="list-style-type: none"> • Subsistent farmer, miner, construction worker 	<ul style="list-style-type: none"> • Animal raiser
Household Income	<ul style="list-style-type: none"> • Between \$1.8 and \$3.3 USD/day 	<ul style="list-style-type: none"> • Less than \$1.7 USD/day
Cooking Device & Fuel	<ul style="list-style-type: none"> • Kerosene burner, or traditional wood or charcoal 	<ul style="list-style-type: none"> • Traditional dung
Cooking Location	<ul style="list-style-type: none"> • Indoors 	<ul style="list-style-type: none"> • Indoors
Cooking Frequency	<ul style="list-style-type: none"> • Three meals per day 	<ul style="list-style-type: none"> • Three meals per day
IAP Exposure	<ul style="list-style-type: none"> • High 	<ul style="list-style-type: none"> • Very High
IAP Awareness	<ul style="list-style-type: none"> • High 	<ul style="list-style-type: none"> • Everyone is aware but they don't know other options
Environment Impact	<ul style="list-style-type: none"> • High 	<ul style="list-style-type: none"> • Medium
Barriers to Switch	<ul style="list-style-type: none"> • LPG affordability (especially for long cooking) • Stove affordability 	<ul style="list-style-type: none"> • Awareness of alternative products • Stove affordability
Willingness to Pay	<ul style="list-style-type: none"> • Medium, but it will require awareness & promotion campaigns 	<ul style="list-style-type: none"> • Low, cannot even afford stove materials
Purchase Drivers	<ul style="list-style-type: none"> • Health • Clean kitchen 	<ul style="list-style-type: none"> • Health • Clean kitchen

Segment Profiles

... 3) Extremely poor rural & urban households with access to wood, and 4) Poor and not poor rural & urban households with access to wood.



3

**Extremely Poor Rural/Urban
(with access to wood)**



4

**Poor and Not Poor Rural/Urban
(with access to wood)**

Size in Households	<ul style="list-style-type: none"> • 193 k (3% of population) 	<ul style="list-style-type: none"> • 1.7 m (23% of population)
Profession	<ul style="list-style-type: none"> • Rural or peri-urban subsistent farmer; Urban construction worker 	<ul style="list-style-type: none"> • Subsistent farmer, miner, construction worker
Household Income	<ul style="list-style-type: none"> • Less than \$1.7 USD/day 	<ul style="list-style-type: none"> • Above \$1.8 USD/day
Cooking Device & Fuel	<ul style="list-style-type: none"> • Traditional wood (open fire) 	<ul style="list-style-type: none"> • Traditional wood (open fire)
Cooking Location	<ul style="list-style-type: none"> • Indoors in the highlands and coast • Outdoors in the rainforest 	<ul style="list-style-type: none"> • Indoors in the highlands and coast • Outdoors in the rainforest
Cooking Frequency	<ul style="list-style-type: none"> • Three meals per day 	<ul style="list-style-type: none"> • Three meals per day
IAP Exposure	<ul style="list-style-type: none"> • Very high in the highlands and coast • Medium in the rainforest 	<ul style="list-style-type: none"> • Very high in the highlands and coast • Medium in the rainforest
IAP Awareness	<ul style="list-style-type: none"> • High, especially in the highlands where they live in enclosed homes without windows 	<ul style="list-style-type: none"> • High, especially in the highlands where they live in enclosed homes without windows
Environment Impact	<ul style="list-style-type: none"> • High 	<ul style="list-style-type: none"> • High
Barriers to Switch	<ul style="list-style-type: none"> • Awareness of alternative products • Stove affordability 	<ul style="list-style-type: none"> • Awareness of alternative products
Willingness to Pay	<ul style="list-style-type: none"> • Low, cannot even afford stove materials 	<ul style="list-style-type: none"> • Medium, but it will require awareness & promotion campaigns
Purchase Drivers	<ul style="list-style-type: none"> • Health • Clean kitchen • Wood savings 	<ul style="list-style-type: none"> • Health • Clean kitchen • Wood savings

Customer Segmentation Summary

Poor households with income between \$50 and \$100 USD per month per person currently using firewood in both rural and urban areas are the largest target segment (1.3M). While they cannot afford LPG, they can probably afford the materials for in situ (in place) construction of improved wood burning stoves.

Customer Segment Characteristics

Segment	Size	IAP Exposure	IAP Awareness	Affordability	Willingness to Pay	Alternative Use	Distribution Access
1 Rural/Urban using charcoal or kerosene (with LPG as secondary or only alternative)	Low	Medium	High	Medium	Medium	Low	Medium
2 Extremely Poor in High Altitude (no access to wood)	Low	High	High	Minimal	Minimal	Low	Minimal
3 Extremely Poor Rural/Urban (with access to wood)	Low	Medium	High	Minimal	Minimal	Low	Medium
4 Poor & Not Poor Rural/Urban (with access to wood)	High	Medium	High	Low	Medium	Low	Medium

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

Since most improved stoves installed to date have been subsidized, to encourage this new market more awareness of options & promotion campaigns are required. Other incentives such as the international "Organic" label requirement for farmers to have clean households have been successful in encouraging them to buy clean cookstoves, particularly within coffee bean producers

In the highlands alternative uses include heating water, and warming the guinea pigs, while in the rainforest uses include repelling bugs

In some highland areas that can only be accessed by foot or donkey this is a challenge, but it is even more so in remote rainforest areas only accessible by river / foot

- **Implications** -

The largest customer segment can potentially afford an improved in situ wood burning stove, but there is still a need for demand creation through awareness campaigns and promotions, as well as a more robust supply of certified builders and distribution of materials.

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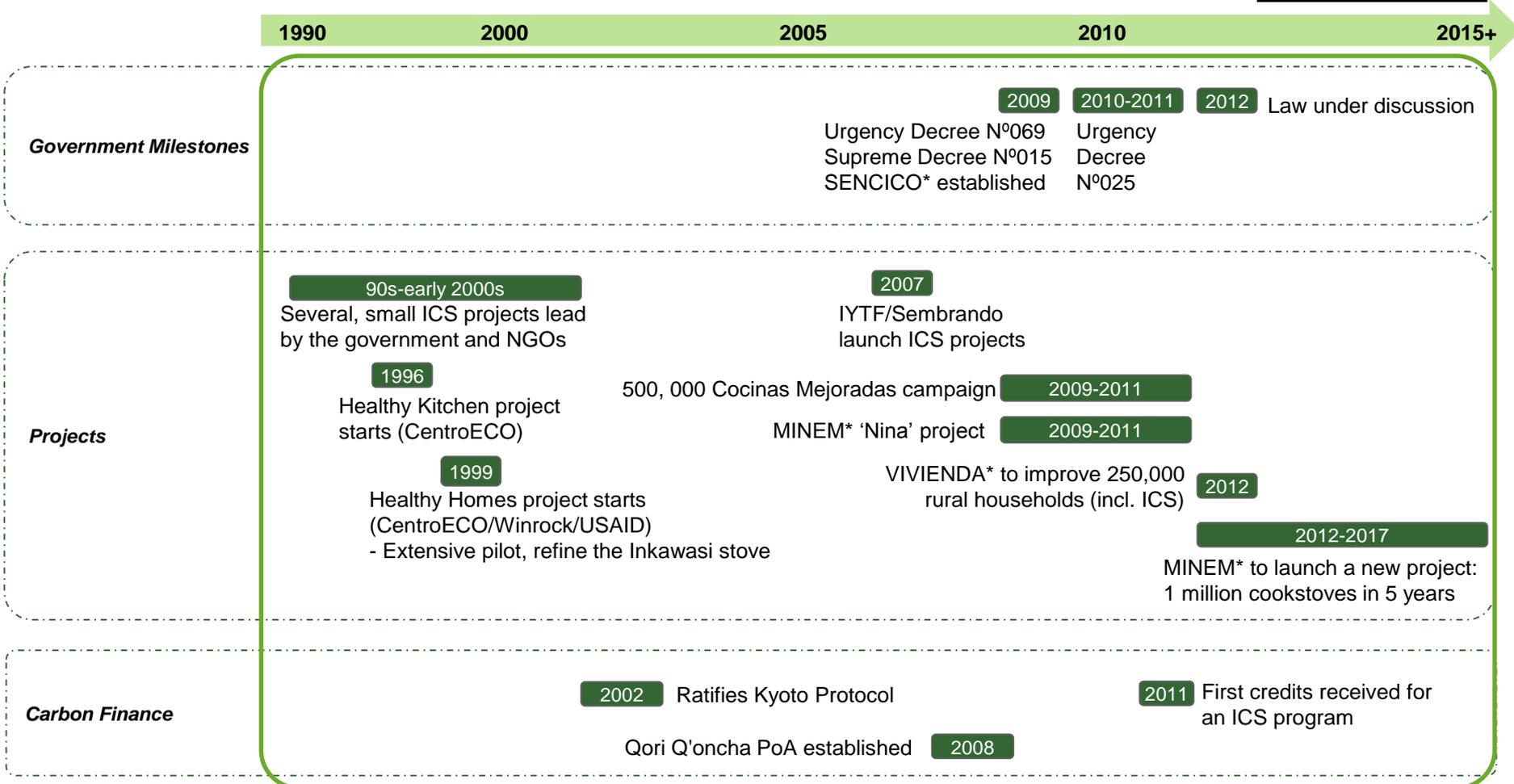
Sector Mapping Summary

Appendix

History of Cookstoves in Peru

Provoked by rapid deforestation and energy supply concerns, improved cookstoves programs have been in existence since late 1980s, with a recent surge in the sector.

Non-Exhaustive



Government Policy Relevant to Cookstoves

The government has developed policies and strategies that aim to secure funding for cookstove projects, ensure quality, and promote regional and local government investment.

Policies

- Public funding for cookstoves (Ministry of Economy & Finance)
 1. *“Canon, Sobre Canon & Regalía Minera”*
 - Special income taxes and right to extraction fees charged to the mining and oil companies (for the extraction of non-renewable resources that belong to the state) of which 50% is given to the the regional and local governments that have mines
 2. *“Decreto de Urgencia N°069, 2009” & “Decreto de Urgencia N°025, 2010-2011”*
 - Decrees that allowed regional governments to use up to 10% of the *“Canon, Sobre Canon & Regalía Minera”* in cookstoves, water systems and latrines until December 2011
 - A law is currently being discussed in parliament to make this resolution permanent and extend its application to non-mining regions
- Cookstove technology improvement (Ministry of Housing & Construction)
 1. *“Decreto Supremo N°015, 2009”*
 - Approves improved cookstove technical standards
 - Designates the Construction Industry National Training Service (SENCICO) as the organization responsible for assessing and certifying improved cookstoves

Strategies

- *Government decentralization*: as part of this strategy the Inter-Ministerial Commission of Social Affairs (ST-CIAS) aims to influence regional and local governments to designate resources towards certified improved cookstove programs
- *“Creceer” National Strategy*: provides technical assistance for national, regional and local governments to plan, monitor and evaluate social programs to reduce poverty and malnutrition

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

Government Programs Relevant to Cookstoves

Peru has several environmental & social programs that target the poor communities.

	Climate Change Mitigation	Housing Access	Poverty Reduction
Program	PRONAMI 2011 (MINAM)	TECHO PROPIO 2011 (MVCS)	JUNTOS 2005 (MIDIS)
Objective	To provide an integral approach to climate change mitigation by coordinating initiatives across sectors, including energy, industry, transport, waste management, forestry and use of land.	To promote, facilitate and/or establish adequate and transparent mechanisms that allow access of the popular sectors to decent housing in accordance with their economic possibilities. One-time funding is given to families as an incentive and complement to their savings and constructing effort.	To contribute to the reduction of poverty by breaking the intergenerational transfer of extreme poverty and generating human capital in poor households. Provides monetary incentives for access and use of health services, nutrition and education.
Results	A number of programs (NAMAs) have been identified across all sectors targeted but mostly around energy and forestry. The program was in validation stage until the end of 2011. No additional information is available at the moment.	Between 2003 and 2001 this program has allowed 7,849 families access to housing and/or housing improvements in 14 regions, most of them in Ica and La Libertad. As of 2011, eligibility rules included having a monthly income of under 1,620 soles, and it provided 18,000 soles in funding for beneficiaries to build or buy housing of up to 50,400 soles (i.e. this program does not fully fund housing –it requires family savings).	The program works with households with children under 14 years old with priority on those with children under 3. It started in 2005 in the district of Chuschi, Ayacucho, where 1,041 households received the Juntos benefits for the first time. By 2011 there were almost half a million households with almost a million children being served in over 28 thousand communities. To receive benefits (200 soles every two months) the families need to comply with requirements such as school attendance.

- Implications -

Cookstove initiatives can be a component of some of the government's environmental and social programs.

Pontifical Catholic University of Peru (PUCP) was working to develop standards, but in 2009 Sencico became the official ICS testing facility. Based in Lima, Sencico sits within the Ministry of Housing, Construction and Sanitation.

Sencico overview

- 25 stove types certified (all in-situ, wood stoves)
- Funded ~50:50 construction sector and services e.g. tuition
- Advise VIVIENDA who in turn create policies
- Aim to unite specialists in a collaborative environment – work closely with academic institutions e.g. PUCP, Aprovecho; NGOs and are working help Bolivia establish a similar facility
- Implementers pay ~ 600 USD to have their stove tested
- Testing scope:
 - Pollution: (CO2 emissions, particulate matter)
 - Energy Efficiency: WBT (5 liters in 35 minutes)
 - Security: e.g. chimney temperature, stove stability
- Stoves are tested for 15 days – 1 month
- Currently performing in-situ stove testing, but only for research purposes
- Looking at alternative fuels in partnership with PUCP. Agricultural briquettes look very promising due to energy content, but the project is in the research stage



Current limitations

- Stoves are built in the testing lab – very expensive for rural implementers to transport materials/skills e.g. there have been issues testing dung due to damage incurred during transportation
- There is no renew process for certification unless the regulations change
- No testing in-field
- No long term durability testing
- Only test the stove design, this may not reflect reality due to the quality of materials/labor available in the field

- Implications -

Sencico has greatly benefitted the ICS sector. However, current limitations should be addressed, especially with regards to field testing.

Illustrations from Current Technology Landscape

The vast majority of stoves in Peru are built in situ with most based on the 'Inkawasi' design. Nearly all ICS in coastal and highland areas have a fitted chimney.

Traditional stove



- Open fire constructed of stones or basic building materials
- Often built indoor at high altitude
- Very inefficient, produces a lot of emissions
- Any biomass fuel can be used – typically wood

- Market share ○
- Availability ●

'Inkawasi' style in-situ stove



- One of the original ICS to be used in Peru – incorporating extensive local input, this was rolled out in the 'Healthy Kitchens Project'
- Recipients often take great pride in the ICS and decorate the stove
- Based on the rocket stove principles; aims to increase efficiency, remove smoke and allow for multiple pots
- Typically 2-3 burners
- Built in the corner of the room
- Considerable reduction in smoke
- Key differences: materials and size of the entrance for the wood (families typically prefer larger holes – less effort to chop wood, but it lowers efficiency)
- Durability issues e.g. stove top

- Market share ○
- Availability ○

Picture 1: Kindly provided by CentroECO

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

Illustrations from Current Technology Landscape

While the 'Inkawasi' style dominates the market, there are some new entrants to the market catering to more specific customer needs.

ICS without chimney



- Used in the rainforest, where the majority cook outside
- This stove is undergoing certification
- Greatly reduces the quantity of wood required
- Cheaper than the stoves with chimneys

- Market share 
- Availability 

Portable Stove



- A new design, won the Ramp Peru 2007 Entrepreneur Prize
- There are only a handful of producers, but the stoves are selling at market price within both rural and urban areas
- The durability remains unclear

- Market share 
- Availability 

Oven/Water Heater



- Stove producers are looking to utilize the stoves to address other household issues (cold in the highlands) as well as provide additional services e.g. hot water, baking facilities
- The oven is relatively cheap (steel drum and adobe), but the water heater is proving more expensive. Both are in the pilot stage

- Market share 
- Availability 

Key |  Minimal |  Low |  Medium |  Medium-High |  High

Illustrations from Current Technology Landscape

Gas stoves are commonly used in the major cities and there has been a surge within rural areas, despite some resistance. Solar and biogas remain in the pilot phase.

Gas & electric stoves



- Widely used in urban areas
- The government (through MINEM) is focusing heavily on LPG stoves and is looking to improve rural distribution and lower the fuel cost
- Awareness and education are critical to the success of these stoves, many people remain sceptical viewing the stoves as expensive, dangerous and inefficient to cook on

- Market share 
- Availability 

Biogas stove



- In the pilot stage
- Major barriers: very expensive to implement, households require a minimum of 3 cows
- Some cultural issues regarding the hygiene aspect, but this can be addressed through campaigns
- More effort required than with a traditional stove

- Market share 
- Availability 

Picture courtesy of:
Practical Action

Solar Stove



- In the pilot stage
- Limited awareness of solar cookers/cooking practices and many associated misconceptions
- Potential especially within the highlands (where fuel is scarce)
- Need extensive training and support for the community to ensure buy-in
- Can't be used for all food items

- Market share 
- Availability 

Picture courtesy of:
Sam Brown

Key |  Minimal |  Low |  Medium |  Medium-High |  High

Existing Markets for Cookstoves and Fuels

With the exception of a handful of small cookstove projects, all initiatives are monitored by the ‘Cocinas Mejoradas por un Perú sin humo’ campaign. The largest project are within the NGO sector, with the exception of the national ‘Proyecto NINA’ led by MINEM in partnership with EnDev GIZ.

‘Centralized coordination’

‘Decentralized coordination’



	Central Gov.	NGOs	Regional Gov.	Local Gov.	Private Sector/ International
<i>Channel</i>	<ul style="list-style-type: none"> The government is very supportive of ICS programs and is actively involved in some of the larger ones MINEM led the Nina project (the 2nd largest ICS project in Peru) 	<ul style="list-style-type: none"> By far the most active with regards to distributing improved cookstoves The largest project (Sembrando) utilizes carbon finance through the Qori Q'oncha PoA 	<ul style="list-style-type: none"> Arequipa's regional government has distributed over 14,000 stoves to date, with 6 others implementing similar projects Lima's regional government have distributed 460+ 	<ul style="list-style-type: none"> Alongside EnDev GIZ, 20 municipalities have implemented/ are currently implementing ICS programs The largest projects are in Cajamarca, Inca & Bambamarca 	<ul style="list-style-type: none"> The private sector is a relatively small player within the sector. The largest project is being led by Minera Barrick International cooperatives are the smallest sector, <500 stoves to date
<i>% of current improved stoves</i>	30%	47%	15%	4%	3%

- Implications -

The “500,000 Improved Cookstoves for a Smoke Free Peru” campaign should be used a key focus for the Alliance, since all major players take an active role in this well governed initiative.

Overview of Major Cookstove Initiatives in Peru

The NGO sector is the largest player in the Peruvian cookstove industry, with the government also heavily involved. Opportunities exist for the academic and private sector, but at present their involvement is minimal.

Private Sector



Government



NGOs



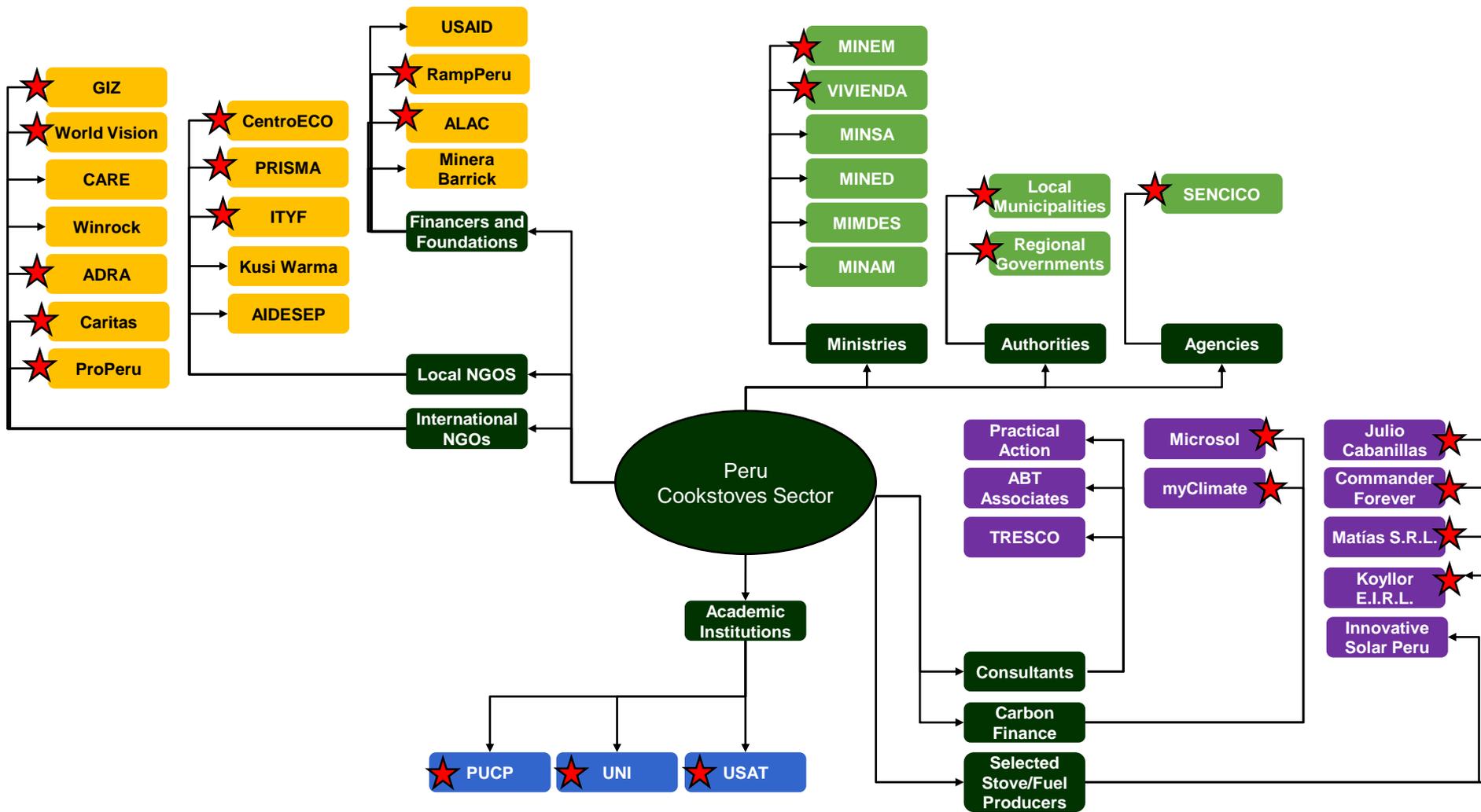
Academia

- Implications -

The sector has a lot of momentum, but the large number of financed NGO and government projects can be stifling for the private sector. A number of academic institutions are keen to contribute.

Peru Stakeholder Mind Map

Non-Exhaustive



KEY: ★ Current Cookstove Project Government NGO Private Sector Academia

Examples of Cookstove Initiatives in Peru

– Government

Several ministries are actively involved in the ICS sector, including the Presidency of the Council of Ministries, showing the level of priority and commitment within the central government.

	MINEM	Vivienda	Local Government
Who	Ministry of Energy and Mining	Ministry of Housing, Construction and Sanitation	Various local authorities
What	<ul style="list-style-type: none"> • Project Nina aims to distribute Improved wood stoves (Inkawasi Tawa) and LPG stoves to rural areas • Long term strategy is to move to gas, but infrastructure is currently a barrier. As such, they provide free stoves and 3 months of gas, also looking to changing national policy to reduce the cost of gas • New strategy: implement 1 million ICS in the next 5 years • 40,204 gas and 64,307 wood burning stoves distributed 	<ul style="list-style-type: none"> • Sencico sits within Vivienda • Currently undertaking a project to improve 250,000 rural houses in Peru (highland and jungle regions) during 2012 – including ICS. The families build their own houses, drawing on support and guidance from Vivienda • Work with Sencico to implement guidelines and policy based on their research 	<ul style="list-style-type: none"> • A large number of local authorities are implementing cookstove initiatives, many of these are working with NGOs, in particular GIZ. GIZ provides a project framework, best practice, training and the local authority often pays for the material/technicians' time • These initiatives differ by region and MINEM were concerned that some authorities are less engaged and expect central authorities to implement the projects
Challenges	<ul style="list-style-type: none"> • Decentralization has been difficult and not all local authorities are engaged • Some communities are resistant to gas 	<ul style="list-style-type: none"> • Limited experience of ICS implementation • Since the project is advisory and households implement the improvements quality assurance may be an issue 	<ul style="list-style-type: none"> • Changes to policy are often clearly, but awareness campaigns sometimes fail to reach the local level • Lack of transparency and clarity between gov. levels
Partners	<ul style="list-style-type: none"> • EnDev GIZ • Several gov. ministries 	Sencico	Numerous NGOs, private companies and gov. bodies
Scope	National initiatives, use INEI data to select communities	National initiatives – implementation and policy	• Local/Regional level

Examples of Cookstove Initiatives in Peru

– NGOs

Various NGOs are distributing stoves but some of the largest, most influential players are highlighted below.

	Sembrando	Healthy Kitchen/Home	GIZ	ADRA
Who	Instituto Trabajo y Familia (ITYF) initiative	CentroECO	German International Development organization	Global NGO: Adventist Development & Relief Agency
What	<ul style="list-style-type: none"> Part of the Mejoradas Cocinas Campaign Largest ICS implementer 90,000+ Improved cookstoves implemented since 2009 2012: plan to work with 13,000 families Holistic approach – provide ICS, improved sanitary facilities, educate the communities about key health principles 	<ul style="list-style-type: none"> 1996: The Healthy Kitchens campaign was initiated (the first major ICS initiative) 1999: Project was refined, the community need to meet certain criteria before being eligible (~200 days effort) Focus on building capabilities in the local community – comprehensive training e.g. deforestation. 6,000 ICS built Monitor every week (2 yrs), then every month (2 yrs) 	<ul style="list-style-type: none"> Together with Sembrando, led the Cocina Mejorades campaign (there are over 20 organizations involved) Champion stove standards/testing – funded the set up Sencico's lab. All stoves in the campaign need to be certified Work with local authorities, building capabilities 	<ul style="list-style-type: none"> Cookstove projects since 2007 with funding from Antamina and Glencore (mining industry) Implemented 10,000 improved cookstoves Now advising ADRA Ecuador (no current ICS projects) and Bolivia 2 days training then select an "agente comunitario" volunteer to build other stoves for the community
Challenges	<ul style="list-style-type: none"> The ex-first lady, Mrs. Pilar Nores is the President. There are concerns that political rivalries could cause contention 	<ul style="list-style-type: none"> Struggled to convince families, they were used to handouts – highlighted the direct & indirect benefits e.g. deforestation impact on food chain 	<ul style="list-style-type: none"> The campaign ended in December 2009, need to ensure that the cooperative relationship between implementers is maintained 	<ul style="list-style-type: none"> Almost all communities near the mines reject anything from the mine and some also reject the NGOs due to the funding
Partners	<ul style="list-style-type: none"> Work with: GIZ, UNDP etc. Receive funding from the Bill and Melinda Gates Foundation (and others) 	<ul style="list-style-type: none"> Implemented with Winrock Funding from USAID Work with local authorities to build capabilities 	<ul style="list-style-type: none"> Work with most implementers through the campaign Strong links with Sencico 	<ul style="list-style-type: none"> Funding from the Antamina Mining Fund: 21,000 USD
Scope	<ul style="list-style-type: none"> National scope, currently implemented in 9 regions 	<ul style="list-style-type: none"> National, through the partnerships with local gov. 	<ul style="list-style-type: none"> National – working with several local authorities 	<ul style="list-style-type: none"> Work regionally, but often dictated by the funder

Examples of Cookstove Initiatives in Peru

– Private Sector

There are very few private sector initiatives within Peru, due in part to the large, subsidised programs.

	Practical Action Consulting	Social Outreach Programs	Stove Manufacturer	Portable stove producer
Who	International consultancy within the development sector. 3 focus areas: Access to energy, basic infrastructure & services; Disaster risk management & adaptation to climate change; Access to markets & production systems	Several large private companies (mostly within the extractive industries provide funding/assistance) e.g. Minera Barrick has helped to implement 4,827 ICS	Private steel manufacturer based in Cajamarca selling cookstove components to large programs (including the local municipality/GIZ initiative)	Local entrepreneur, (Julio Cabanillas) started producing cookstoves in 2000 (in-situ 'Inkawasi'). Identified a market for portable stoves, started producing them and selling them in his shop
What	<ul style="list-style-type: none"> • Distribute improved cookstoves as part of a holistic community development project • 320 cookstoves installed in Cusco (project Allimpaq) • 30 household biogas plants installed (heavily subsidized) • Carry out research within the wider Energy sector 	<ul style="list-style-type: none"> • The companies often provide funding (in addition to the compulsory taxes), but often reserve the right to steer the project e.g. project location • Repsol provide educational material for the MINEM roadshows which aim to increase the demand for LPG 	<ul style="list-style-type: none"> • Company consists of 15 men/4 women • Implemented modern machinery and process improvement to enable them to scale up and retain high quality – the quality was stressed as vital by their customers • Can produce 800 chimney parts/day - very efficient 	<ul style="list-style-type: none"> • The portable stove won the Ramp Peru entrepreneur competition in 2007 and was given business training by the Catholic University • Sells the portable stoves with a 1 year warranty and suggests regular maintenance checks • Also produces in-situ stoves that heat water – new venture
Challenges	<ul style="list-style-type: none"> • Biogas initiative is very expensive 	<ul style="list-style-type: none"> • Potential conflicts of interest • Some communities adamantly reject this support 	<ul style="list-style-type: none"> • Corruption remains a barrier, have lost gov. tenders to less experienced competitors 	<ul style="list-style-type: none"> • Has a 5th grade education, he's acutely aware that this holds him back
Partners	<ul style="list-style-type: none"> • Ingeniería sin Fronteras, UPC and Green Empowerment • Working with Bolivian/ Peruvian local authorities 	<ul style="list-style-type: none"> • Various – local governments, NGOs etc. 	<ul style="list-style-type: none"> • Working closely with GIZ, local authorities to provide for large tenders 	<ul style="list-style-type: none"> • Care Peru • Local government • Mining company – Conga Project
Scope	Regional projects, mostly in the Cusco and Cajamarca regions	Typically focus on the regional level	Produce materials for the Cajamarca region. Keen to scale up	Produces stoves for the Cajamarca region

Examples of Cookstove Initiatives in Peru

– Academic

The academic sector in Peru is involved in government and NGO initiatives as well as conducting independent research to further the sector

	PUCP	UNI	USAT
Who	Pontifical Catholic University of Peru	Universidad Nacional de Ingeniería	Universidad Católica Santo Toribio de Mogrovejo
What	<ul style="list-style-type: none"> Involved in cookstove research for 10 years, with efforts ramping up in the last 5 years (within the GRUPO department) Have a cookstove testing facility; review stove efficiency and review implementation models Have produced some stoves in-house, strongly believe the communities should be offered a choice of stove Have a number of holistic housing projects for the Andean region – ICS, insulation and a 'heating wall' which uses greenhouse principles Working on stoves that produce hot water 	<ul style="list-style-type: none"> Working with MINEM to research improved wood burning cookstoves for use in the Nina project Undertaking a project with Sencico to create a stove for the highlands. Current ICS do not provide an heat to the surrounding area – critical due to the altitude <i>Awaiting additional information</i> 	<ul style="list-style-type: none"> Economics student working with various NGOs (primarily Sembrando) to understand the long-term issues facing cookstove initiatives Focussing on stove durability and long-term stove use The study has enabled Sembrando to improve their stoves Also looking at the economic case for ICS, strongly believes that the initiatives are a cost effective approach to addressing major health issues in rural areas
Challenges	Testing is limited to the WBT and basic emissions testing	<i>TBC – awaiting response</i>	Limited funds and exposure to other ICS initiatives. The study concludes July 2012
Partners	<ul style="list-style-type: none"> Microsol – producing 2 courses on 'how to build an ICS' for rural communities Several NGOs e.g. Caritas, Red Cross MINEM – stove development (LPG) Sencico – certification support 	<ul style="list-style-type: none"> MINEM – stove development (wood) Sencico – working on a stove which warms the surrounding area 	<ul style="list-style-type: none"> Sembrando
Scope	Working to develop the sector, no financial goal	Working to develop the sector	Studying the long term viability of ICS initiatives

Cookstove Industry Value Chain

Peru is advanced in several areas – namely coordination capabilities, carbon financing and testing facilities. NGOs and the government are very able within core areas, but monitoring remains an issue.

Key:	Manage Program				Raise Awareness			Provide & Support Stoves									
	Coordinate Program	Provide Funding	Coordinate Project (Region)	Centralize Act. (Mktg, Ops, Fin)	Educate on IAP	Raise product awareness	Run Promo Activities	Import & retail stoves	Design stoves	Train Stove Manufacturers	Test stoves	Supply Materials	Transport mat. to Manufacturer	Make stoves	Transport stove to customer	Sell and install Stoves	Maintain Stoves
Multilaterals/Donors	Full	Full	Full	Partial	Full	Full	Full	No	Full	Full	Basic	Basic	Full	No	Partial	No	No
Government	Full	Full	Full	Full	Full	Full	Full	No	Basic	Full	Full	Full	Full	Full	Partial	Partial	Partial
Bank/Financial Institution	No	Partial	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
NGOS and iNGOs	Full	Partial	Full	Full	Full	Full	Full	No	Full	Full	Partial	Full	Full	Full	Partial	Partial	Partial
Local Manufacturers	No	No	Basic	Basic	Basic	Partial	Basic	No	Basic	Basic	Basic	Partial	Full	Full	Partial	Partial	Basic
International Manufacturers	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Local Entrepreneurs	No	No	Basic	Basic	Basic	Partial	Basic	No	Basic	Basic	Basic	Basic	Partial	Partial	Partial	Partial	Basic

- Implications -

Many initiatives rely on donor funding, with a notable absence of private sector initiatives. Although expensive, distribution is possible; however, the situation is less positive for stove maintenance with many project implementers performing limited follow up.

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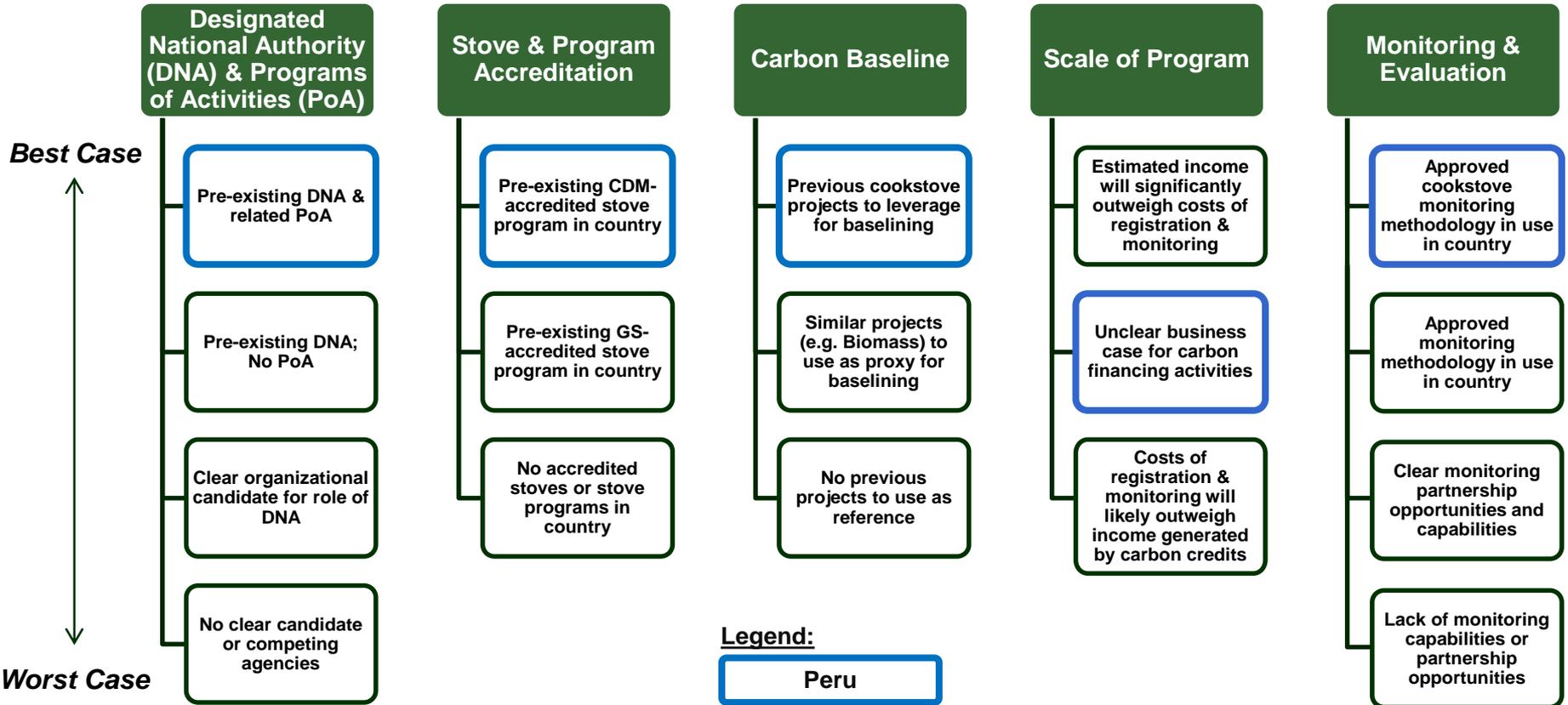
Sector Mapping Summary

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Carbon Finance Market Attractiveness

Peru is established within both the CDM and the voluntary carbon market. The Qori Q'oncha POA was the first improved stove program registered in the international carbon market.

Carbon Finance Attractiveness Criteria – Peru



- Implications -

Peru has very favorable conditions for carbon finance, but there are some concerns about the cost of monitoring. Peru would benefit from best practices in other geographies.

Carbon Finance Programs

Microsol's Qori Q'oncha Program of Activities is currently the only carbon initiative in the sector (90% of cookstove projects in Peru fall under the program), using the Gold Standard VCM.



Qori Q'oncha – Improved Cook Stove Diffusion Program in Peru

"We don't believe the perfect stove has been invented yet, this is why the PoA is so important, it supports all stove technologies.... We're keen for the government to move into the sector as we're becoming a natural monopoly" – Microsol

"Qori Q'oncha has...targets that allow the improvement of living conditions in the rural population, especially in poorer areas. The Ministry of Health welcomes the...Program"

- Ministry of Health (MOH)"

Participants

- Project Owner/Implementer: Microsol
- Carbon Finance Partner: myClimate
- Location: Nationwide, Peru

Description

- Certification: Gold Standard VER
- Start Date: September 2008
- Project Status: Operation
- Emission Reductions: 331,754 t CO₂e (over 7 yrs)
- 90% of projects are under the program
- Approximately 85,000 improved stoves built within Peru by strategic partners - public and private
- The same model is used by Microsol in Mexico
- Provide extensive support to partners, including comprehensive guidance for the first 2 years
- Don't invest in the projects' initial costs, favoring sustainability - providing a platform for the project to move forward
- Any project with more than 1,000 cookstoves can join the PoA

- Implications -

Microsol is a key partner of the Global Alliance for Clean Cookstoves (leader of the Carbon Credit Risk group), and has extensive carbon credit experience and relationships in country.

Overall Carbon Finance Feasibility

Peru has a unique opportunity to leverage existing carbon financing activities (Qori Q'oncha) to support clean cookstove programs; however, this is not without risks.

Highlighted Market Strengths

Existing Designation National Authority

Large Program of Activities established for improved cookstove projects

Comprehensive support the PoA, all sectors supported the initiative and expressed their high regard for the support

Sembrando (through the PoA) were the first such organization to obtain carbon credits globally

Considerable finance available (from the government in particular) enables initiatives to scale up

Most large initiatives use only a small number of stoves, easier to test, building confidence and demonstrate additionality

Ideal Market Conditions for Future Cookstove Program Carbon Financing in Peru

Potential Risks

- Reliance on laborious monitoring and evaluation processes – especially since most ICS are built in situ
- Several NGOs raised concerns that although Microsol were very supportive, they were still deterred by cost/complexity
- Limited follow up of most projects creates a risk that the stoves may lack the durability required to show additionality
- Microsol's PoA is currently a monopoly (they raised this as a concern for the sector)
- LPG is high priority for the government – could impact viability of Improved wood burning stoves
- The government can't benefit and is a major implementer

- Implications -

There is considerable potential for carbon financing in Peru, especially due to the PoA and existing precedents. However, concerns remain due to M&E, stove lifespan/durability, and increased LPG availability.

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Cookstove Industry Summary

The Peru cookstove sector is dominated by subsidized government and NGO initiatives looking to increase ICS use within the poorest communities.

Macro	Social Impact	Consumer	Cookstove Industry	Carbon Finance
<ul style="list-style-type: none"> + Strong government support and implementation + Government actively looking to assist poorer communities + Deforestation is a high priority + Increased awareness of IAP health impacts - Although decreasing, corruption remains an issue - Lack of awareness/ understanding of clean fuels e.g. solar, biogas, LPG 	<ul style="list-style-type: none"> + Address the main source of IAP. Especially in the Andes, this can be devastating for families + ICS can save many people a lot of money or time – which can be used on other ventures 	<ul style="list-style-type: none"> + Relatively high consumer awareness of basic IAP risks + Target communities are very supportive of the in-situ improved wood/dung stove - Long term health implications are less clear - Rural communities very sceptical of cleaner fuels e.g. LPG - 'Free stove' programs may struggle from long term 'buy-in' regarding maintenance etc. 	<ul style="list-style-type: none"> + Government and NGOs are heavily involved in cookstove sector + Several large initiatives distributing certified stoves + Testing lab established, certifying stoves (although no regulation for materials/ technicians in the field) - While possible, last mile distribution is expensive - Limited private sector involvement 	<ul style="list-style-type: none"> + Very attractive CF market characteristics + PoA established and works with 90% of implementers + Strong governance from Microsol + 1st carbon credits successfully received - Many projects are still in their infancy and have concerns regarding cost/ complexity - PoA is a natural monopoly - M&E remains weak
Favourable	Favourable	Moderately Favourable	Favourable	Favourable

- Implications -

The market has substantial funding and support, but there needs to be an increased focus on long term sustainability in terms of stove durability and reduced dependence on subsidies.

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Case Study A: National ICS Campaign

- **Organization:** Multi-organizational (20+). Initiated and led by GIZ/EnDev
- **Region:** Nationwide
- **Stove/Fuel/Price:** Various
- **Overview:** June 2009 – December 2011: Por un Peru sin humo
 - ✓ 5 leading institutions within the ICS sector formed a central nucleus (Endev-GIZ, ST-CIAS, Juntos, OPS, ITYF)
- **Funding:**
 - ✓ 2 government institutions sponsored this initiative politically (STCIAS & Programa Juntos)
 - currently being restructured (impact unknown), they don't build stoves, but did help to build the framework
- **Stoves Distributed:**
 - ✓ 223,575 across all members
- **Best Practices:**
 - ✓ Created a central location to capture program results/strategies/best practice and track progress
 - ✓ The strategy was to influence actors that have power of influence in the public agenda, now that the issue is institutionalized and in the public consciousness, the strategy is being redefined (due July 2012)
 - ✓ Pre 2008 the country lacked data regarding the health impacts, this was the campaign's top priority
 - ✓ Projects must use certified stoves – proven improvements in emissions, energy efficiency and safety
 - ✓ Use community leaders to reach households. Train women identified by the Juntos program
 - ✓ Run small media campaigns through radio (e.g. government of La Libertad) to ensure the correct use of the stoves
 - ✓ Value previous knowledge/resources developed by each campaign participants (“la suma de esfuerzos”)



Campaña
MEDIO MILLÓN DE
COCINAS MEJORADAS
POR UN PERÚ SIN HUMO
Un compromiso para mejorar la calidad de vida de los peruanos
a través de la masificación de las cocinas mejoradas certificadas.

Case Study B: Carbon Financing

- **Organization:** Microsol
- **Region:** Nationwide
- **Stove/Fuel/Price:** Various
- **Overview:** Social business established in 2007 (partnered with myClimate in 2009)
- **Funding:**
 - ✓ May 2011: Qori Q'oncha achieved its first verification under the Gold Standard, generating its first credits in October 2011, delivering >\$ 660,000 to local partners
 - ✓ Launched Qori Q'oncha PoA – using carbon markets to lower the price of ICS
 - ✓ PoA is under the VCM Gold Standard, but was accredited by a UN auditor (2010)
 - ✓ 2010: Microsol diversified, supporting developers of ICS, biogas digesters, solar panels/heaters, micro-hydroelectric stations, water filters, etc. using carbon markets
- **Stoves Distributed:**
 - ✓ Approximately 85,000 across Peru via strategic partners - public and private
- **Best Practices:**
 - ✓ Greatly increased access to carbon markets for cookstove implementers (75% of the money from the carbon credits goes to the implementer): provide support to projects pre and post implementation; perform 80% of the work needed for organizations to join the POA – complexity and cost are key concerns for implementers
 - ✓ Qori Q'oncha program ensures health and environmental improvements are realized by imposing the following criteria: proven firewood saving, use of local materials, chimney
 - ✓ Keen to fostering the cookstove market: currently lead the Alliance's Carbon Credit Risk group, perform studies to support their activities (e.g. Forestry, Social Impact, Additionality, etc.)
 - ✓ Assisting a large percentage of the market (90% of organizations currently distributing ICS in Peru)



Case Study C: In Situ Stove Implementation

- **Organization:** GIZ/EnDev
- **Region:** Nationwide
- **Stove:** Inkawasi (9 models – with/without chimney, firewood/dung)
- **Price:** Variable
- **Funding:**
 - ✓ German, Dutch and Norwegian government fund GIZ
 - ✓ Local municipalities provide financial support
- **Stoves Distributed:** 100,000 Inkawasi stoves
- **Best Practices:**
 - ✓ Well designed stove (worked with SENCICO), claim if well-maintained and correctly used, can save up to 62 % of firewood compared to an open fire
 - ✓ Quality assurance process in place: stoves built by trained technicians, follow ups ensure correct stove use and maintenance
 - ✓ The family must contribute time and money (building the adobe base, technician, basic materials) to ensure buy in (means tested)
 - ✓ Project provide key materials: chimney, grill, stove top and special bricks for the combustion chamber (120-180 soles)
 - ✓ Regions/households are selected using the SISFOH report
 - ✓ The project requires that the stove is built in an enclosed area, which is kept clean and meets basic hygiene requirements e.g. no livestock kept in the kitchen



Case Study D: Portable Stove Design

- **Organization:** Cocinas Mejoradas Multiuse JCS
- **Region:** Cajamarca
- **Stove:** Portable metal stoves and in-situ combined/water heater systems
- **Price:** Portable stove = 650 soles; fixed stove/water heater = 1,000 soles
- **Funding:** Self funded, lacks capital to expand. Local Catholic church provides business tuition since he won the RampPeru Entrepreneur Prize in 2007
- **Stoves Distributed:** 400 portable stoves (200 to individual families, 200 via a mining company); 800 fixed stoves with CARE; *4000 stoves in total*
- **Best Practices:**
 - ✓ Innovative approach, not many producers of portable stoves (he is only one in the Cajamarca region)
 - ✓ Looking for a holistic solution – offering a built in water heater for households (there is considerable interest in this, but the cost is prohibitive for most)
 - ✓ Shows that a market approach can work (presumably for those outside the bracket being reached by NGOs/Gov.)
 - ✓ Keen to scale up, but lacks confidence due to his poor education – he was acutely aware that this restricted him



Case Study E: Stove Parts Supply

- **Organization:** Industrias Yopia – started in 1994, started working with stove producers in 2010
- **Region:** Cajamarca
- **Stove:** Produce parts for the in situ stove: chimney, grill, stove top
- **Funding:** Self funded, machinery and capital remain limiting factors.
 - ✓ Municipalities often delay payments by up to 3 months
 - ✓ Can obtain loans – maximum is 50,000 soles; 3-4% interest (Banco Edificar)
 - ✓ When they win a tender, they need to place a deposit in the bank as a guarantee (standard practice nationwide)
- **Best Practices:**
 - ✓ Have streamlined the business to enable them to scale up once funding is available
 - ✓ Differentiate themselves by ensuring high standards/quality assurance. This has been key to winning support from implementers. The company invested time to learn about the stoves, how they work and why the measurements are critical and hence are conscious of the importance of the specification
 - ✓ They guarantee to distribute the stoves to **all** areas. This cost is factored into the bid, they may need to subcontract this out when the rural communities are very remote
 - ✓ Employ women (despite prejudices); 15 men/4 women (women typically do the less physically demanding work e.g. chimney tops). The husbands do not support the women working in this type of job, but they remain due to the income (20 soles/day)



Case Study F: Innovation: Livestock Financing ICS

- **Organization:** CentroECO/Winrock/USAID
- **Region:** Rural district of Inkawasi, Lambayeque
- **Stove:** Inkawasini Stove
- **Price:** 377 of the stoves were bought using the livestock micro-financing
- **Funding:** 413 (by September 2007)
- **Stoves Distributed:** TBC
- **Best Practices (Micro-financing with livestock):**
 - ✓ Worked with the poorest in Peru, who had very limited/no access to money
 - ✓ They created a micro-loan influenced system using livestock. They gave the families guinea pigs/chickens and then took the first two litters/batches of eggs as payment for the stove and interest on the loan respectively
 - ✓ At the end of the project the families had an ICS and a source of income from the livestock
 - ✓ Men typically controlled the household finances and this approach not only enabled access to 'finance', but also removed the (sometimes difficult) men from the equation, since the women typically 'owned' the livestock
 - ✓ The project also taught improved animal husbandry techniques to the communities
- **Best Practices (Competitions to raise engagement):**
 - ✓ The communities they dealt with were typically very house proud and they used this to hold competitions in each community which celebrated stove maintenance/decoration
 - ✓ This strengthened the support from the community and the stoves became a source of elevated social status
 - ✓ Ensured good maintenance of stoves and kitchens were kept in a good condition



PERU HEALTHY KITCHEN/HEALTHY STOVE PILOT PROJECT



Case Study G: Household Biogas Pilot

- **Organization:** Practical Action
- **Region:** Cajamarca
- **Stove:** Biogas
- **Price:** 10m³ digester = USD500, produces gas for 2-3 hrs of cooking
- **Funding:**
 - ✓ Subsidised by Practical Action
 - ✓ The household requires 3 cows (20 kg of dung) and access to water
 - ✓ Residents installed 4 polyethylene bio-digesters as a pilot
- **Stoves Distributed:** 30
- **Best Practices:**
 - ✓ Innovative solution to the issue of household energy supply
 - ✓ Bio-digesters were changed to a polyethylene geo-membrane, due to the poor quality of polyethylene which is marketed in Peru
 - ✓ Working with the Bolivian and Peruvian government in this pilot study to access the long term scalability
 - ✓ Collaborative study, working with: Ingeniería sin Fronteras, UPC University, GRECDH), Investiga and Green Empowerment
 - ✓ Access to financing is a major barrier
 - ✓ If there is a market, they are proposing that the program may finance 25% of the costs



Pictures kindly provided by: Practical Action