Preparation of a Clean Cooking Solutions Roadmap and Investment Prospectus for Guatemala Honduras, and Nicaragua

Summary Presentation

JUNE 2015



Background and context on the project

Guatemala

Nicaragua

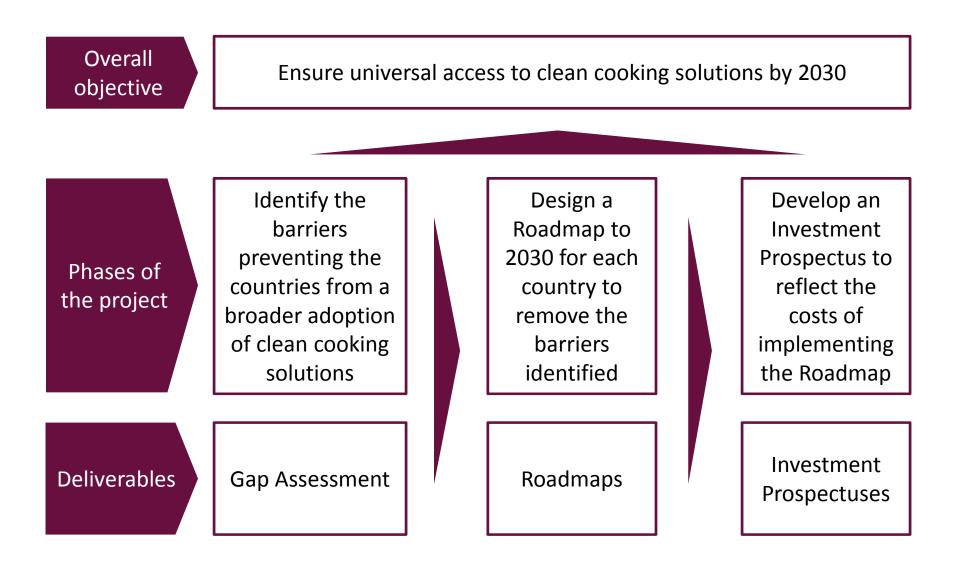
Approach to investor outreach

Next Steps

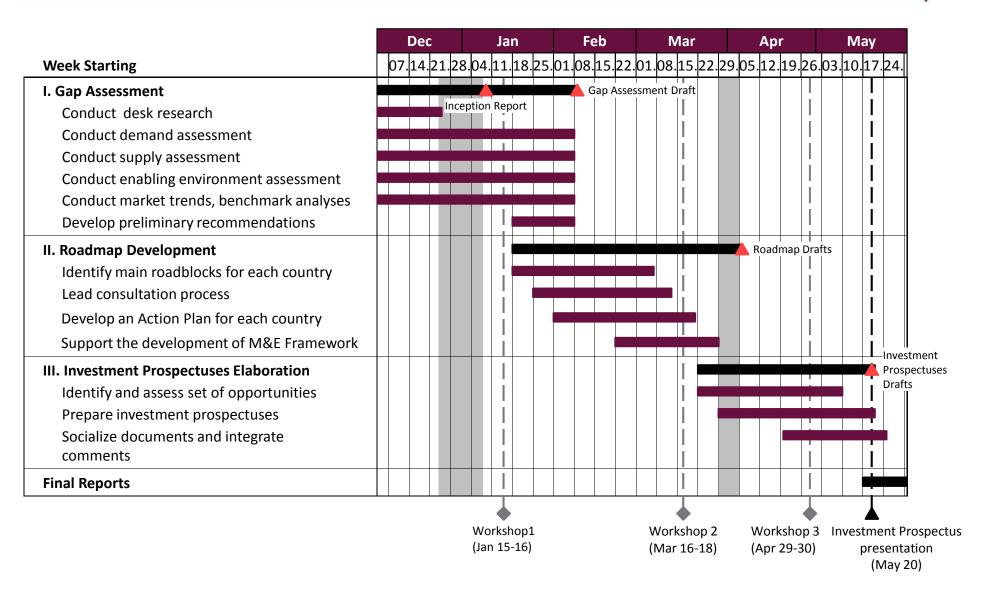
The WB LAC Sustainable Energy group has led this project with the support of Dalberg and extensive contribution by country stakeholders

- The World Bank (WB) Group has over 20 years of experience in working to scale clean cooking solutions in South and East Asia, Sub-Saharan Africa and Central America.
- The on-going engagements of the WB in these regions include the Central America Clean Cooking Initiative (CACCI).
- CACCI aims to provide technical assistance to the governments of Guatemala, Honduras and Nicaragua and support them in eradicating the dependency on traditional stoves by 2030.
- The project presented in this document is part of the WB CACCI efforts.
- This project has been funded by the initiative Sustainable Energy for All (SE4ALL) and CACCI. SE4All is a global initiative focused on providing universal access to energy, improving energy efficiency and increasing the use of sustainable energy.
- The WB hired Dalberg Global Development Advisors to support the focus countries of this assignment, Guatemala, Honduras and Nicaragua, throughout this project.

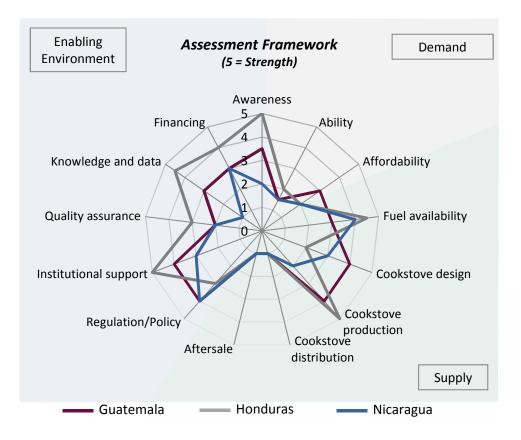
The overall objective of this project is for the countries to design their own path towards universal access to clean cooking by 2030



This project has been completed on a span of 6 months



The team has used a Clean Cooking Solutions Ecosystem Framework to identify the relative strengths and weaknesses within each country



For the Gap Assessment the team takes an **ecosystem approach** to evaluate the gaps and barriers and considers the determinants of:

- **Demand**: including awareness, ability (usage) & affordability
- Supply: including fuel availability, stove design, production, distribution and after-sale support
- **Country Enabling Environment**: including policy, institutional support, quality assurance, data and access to finance

The insights of the Gap Assessment feed into the Roadmaps and Investment Prospectus.

The Roadmap and Investment Prospectus systematically approach each of the barriers of the framework, nevertheless they place an emphasis on those areas of relative weakness. Background and context on the project

Guatemala

- Nature of the Challenge
- Catalyzing a Transformational Change
- Needed investments to transition to Clean Cooking

Nicaragua

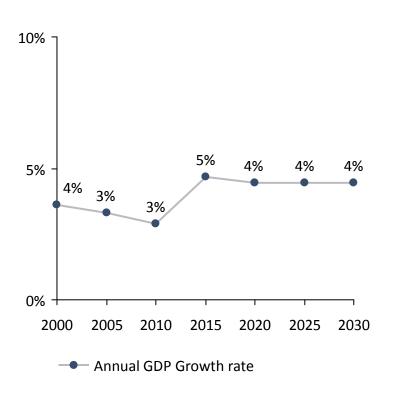
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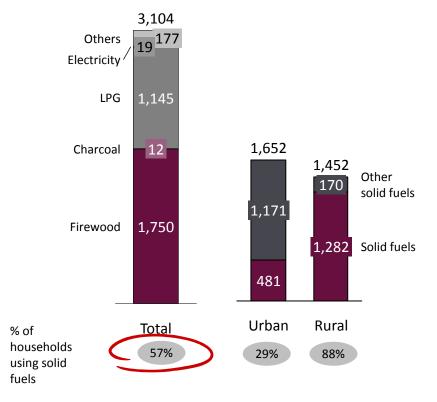
Despite the economic growth experienced by Guatemala, almost 60% of their populations cook primarily with wood

Despite the economic crisis of 2008, the GDP has kept a positive trend

Still, 57% of the households today cook with solid fuels, primarily wood



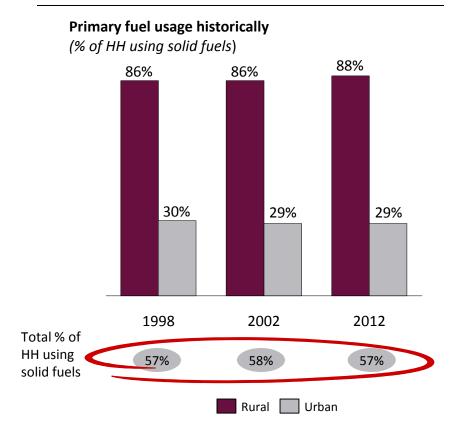
Primary fuel usage for cooking breakdown (2012) (000 households)



Source: World bank; Banco de Guatemala; Global Alliance for Clean Cookstoves; Guatemala Cookstoves and Fuels Market Assessment, 2013; Dalberg 8 Dalberg analysis.

This % has barely decreased in the last 15 years, despite the efforts of the country to mitigate the problem

Rural HH are the main users of solid fuels for cooking and have slightly increased their usage over time



Guatemala has a history of ~40 years promoting clean cooking

- In 1976 the model LORENA (combination from "lodo" mud and "arena" sand) was launched. The stove was disseminated at scale and became the foundation for subsequential refined models.
- In 1996 the Fondo de Inversión Social (FIS) started disseminating ICS (plancha). It is estimated it disseminated 160k stoves until 2008, when the FIS was dismantled.
- Other governmental programs such as FONAPAZ, ProRural, FODIGUA and DICOR have disseminated cookstoves, although the number and the adoption rate is unknown.

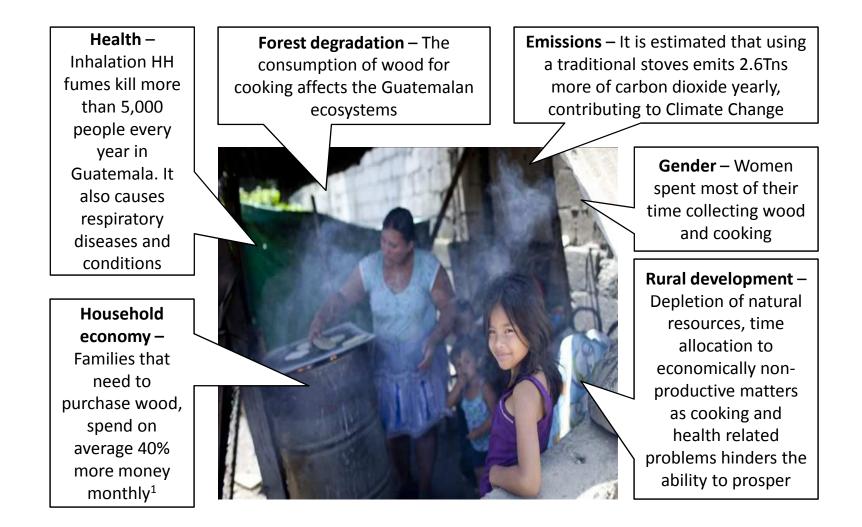
Out of the ~57% HHs that mainly use solid fuels for cooking, the great majority use traditional cookstoves, although fuel stacking is significant

Built-in-place ICS with chimney has been ~20% of the population use a the predominant ICS model combination of wood with other fuels Cookstove penetration by type (2012) Household fuel use (% of households¹) (000 of households) 3,319 ICS: 280-380 thousand of households (9-12%) 27% Other fuels² only LPG/Electricity/ Wood Not Primarily 21% Others: (Includes other fuels²) Traditional: 1,242-1,442 1.382-1.482 thousand thousand of of households households (40-(45-48%)46%) Wood Primarily 52% Modern/Renewable fuel Solid fuel 2015 ~1.762 thousand of ~1.342 thousand of households (57%) households (43%)

1. Estimates assume one cookstove per household; 2. Primarily LPG, Electricity, Kerosene

Source: Global Alliance for Clean Cookstoves; Guatemala Cookstoves and Fuels Market Assessment, 2013; "Resultados de la Investigación de Dalberg 10 Mercado Secundaria: Segmentación de Mercados e Identificación de Segmentos Prioritarios", Fast-Track Carbon, Febrero 2015; Dalberg analysis.

Cooking with traditional stoves is a multidimensional problem, that severely affects 2.4 million households



A complex set of challenges has prevented Guatemala from a broader adoption of clean cooking technologies

Demand

- Low awareness about the negative consequences of cooking with traditional stoves and the existence of alternatives.
- Limited affordability of existing alternatives, which combined with the existence of programs that heavily subsidize the stoves depress market development.
- Little training received by users on installing, using, maintaining and repairing the stoves, leading to eventual breakdowns and mistrust in the technology.

Supply

- Limited availability of fuels that pushes households to use wood instead of LPG, electricity or even sustainable wood.
- Narrow variety of models that do not fully adjust at the needs of potential users.
- **Constrained productive capacity** to produce stoves at a significant scale.
- Weak distribution networks that rely on NGO and government programs to reach out users.
- Inexistent after-sale services that hinder the usage of the stoves over time.

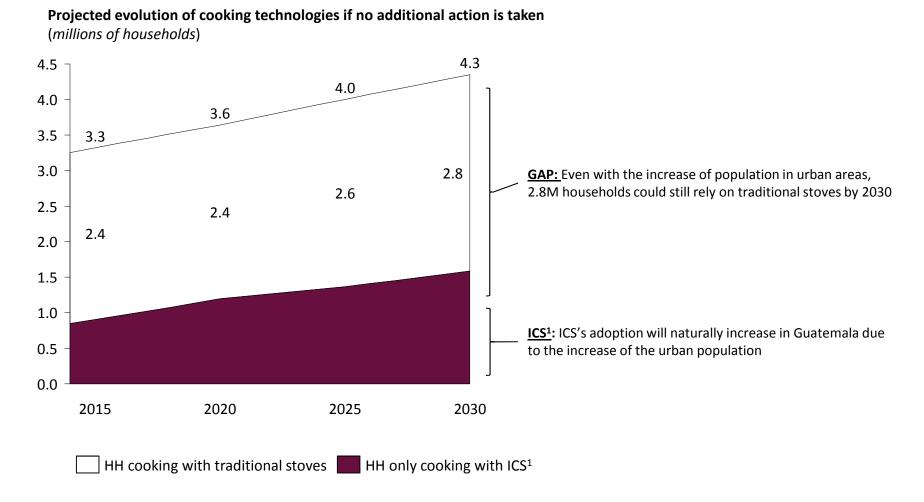
Enabling Environment

- Few policies and regulations that promote the usage of cleaner cooking technologies and fuels.
- Uncoordinated institutional support that limits the success of programs launched in parallel by several public agencies.
- Lack of quality standards that does not guarantee certain efficiency and emissions standards.
- Limited knowledge and data, that hinders effective decision making.

INSERT GAP ASSESSMENT DOCUMENT AS BACKUP

In 2015 out of the total 3.3 million HH in Guatemala, 2.4 cooked with traditional stoves, this number could increase to 2.8 HH in 2030

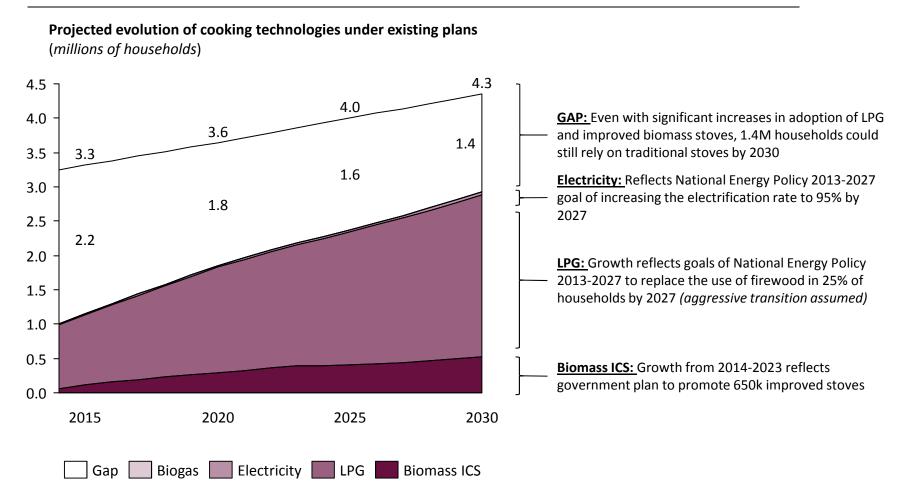
If no additional action is taken, the number of HH cooking with traditional stoves could increase from 2.4 million in 2014 to 2.8 in 2030



1. ICS includes biomass improved cookstoves, LPG stoves, Electricity stoves and biogas stoves. Source: Interviews; Desk research; Dalberg analysis.

Even taking into account the aggressive plans to expand LPG and biomass ICS, ~1.4 million HHs could still rely on traditional stoves in 2030

The existing government and country plans to increase the penetration of LPG, electricity and Biomass ICS will only reduce the amount of HH cooking with traditional stoves partially



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Next Steps

All relevant stakeholders in Guatemala have come together to develop a holistic Roadmap

Stakeholders have participated in a series of workshops

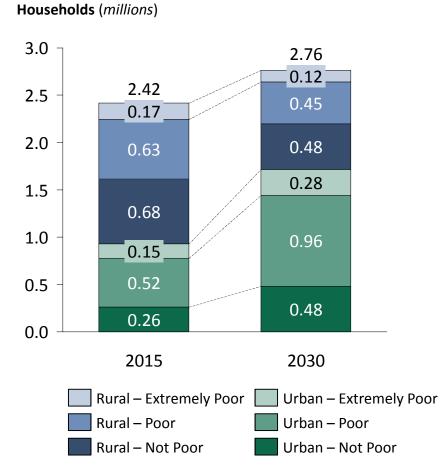


The roadmap developed takes an ecosystem approach

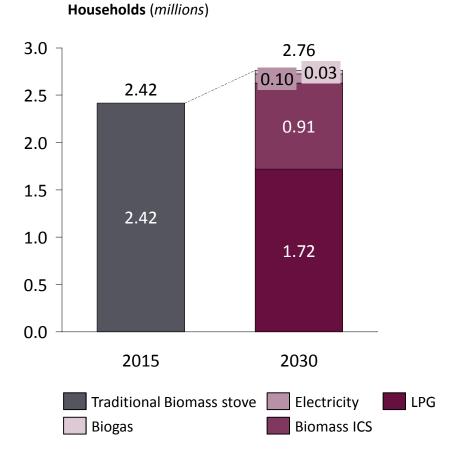
- The objectives of the Roadmap are the following:
- Demand:
 - Increase demand of clean cooking solutions
 - Increase usage of clean cooking solutions over time
 - o Diversify financing options and affordability
- Supply:
 - Increase the variety of stoves models
 - Scale the up the production of stoves
 - Increase/reinforce the distribution and aftersales networks
- Enabling environment:
 - Ensure policies and regulations are in place
 - Enhance institutional support
 - Evaluate and certificate stoves
 - Collect updated information and make it available

To close the gap, the Roadmap aims to transition different population segments to cleaner technologies using specific strategies

The target population can be categorized by socioeconomic strata and geography

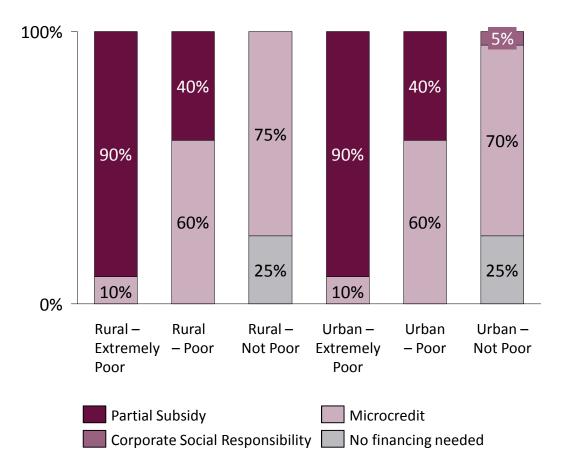


The Roadmap migrates the target population to cleaner fuels



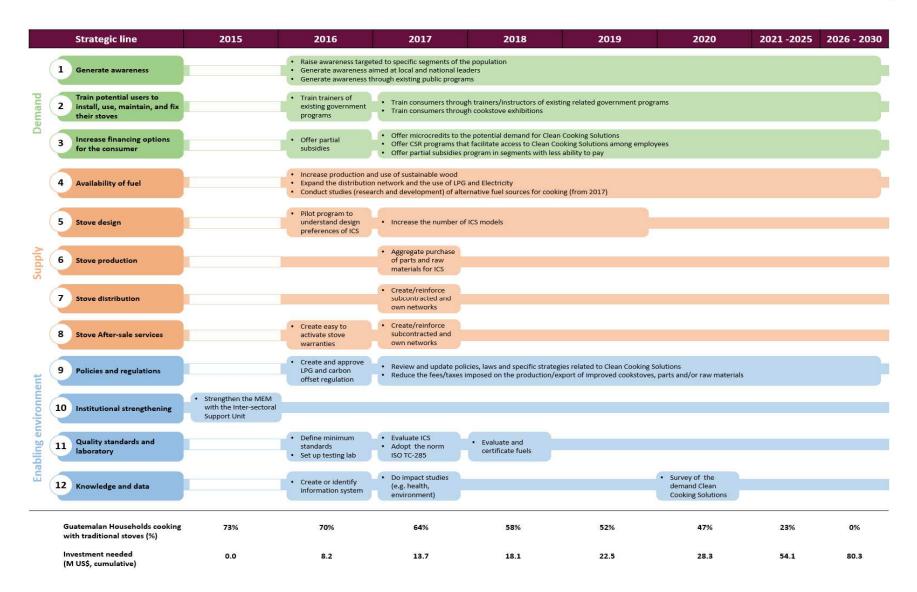
For instance, the Roadmap contemplates different financing mechanisms for different segments to access the technologies

Different type of subsidies, microfinance and CSR initiatives are targeted to different segments



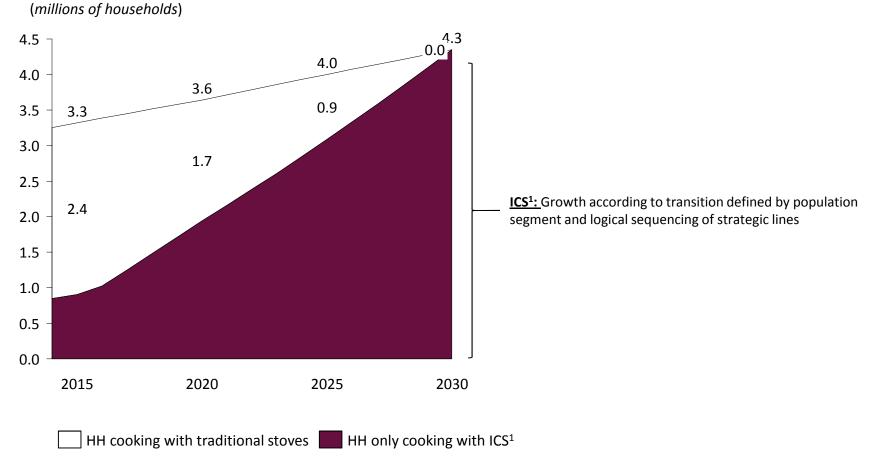
- Partial Subsidy = subsidies 70% of the cost of the ICS
- Microcredit = finance 70% of the cost of the ICS
- Corporate Social Responsibility = finance 70% of the cost of the ICS
- No financing needed: the HH cover the whole cost of the ICS

Recognizing that all the Strategic Lines are important, the Roadmap defines the logical sequence between them to maximize impact



The Roadmap aims to eradicate the dependency on traditional stoves and help transition all households to clean cooking solutions by 2030

The correct implementation of the Roadmap would close the gap previously identified, and would enable all Guatemalan households to cook with ICS¹ by 2030



1. ICS includes biomass improved cookstoves, LPG stoves, Electricity stoves and biogas stoves.

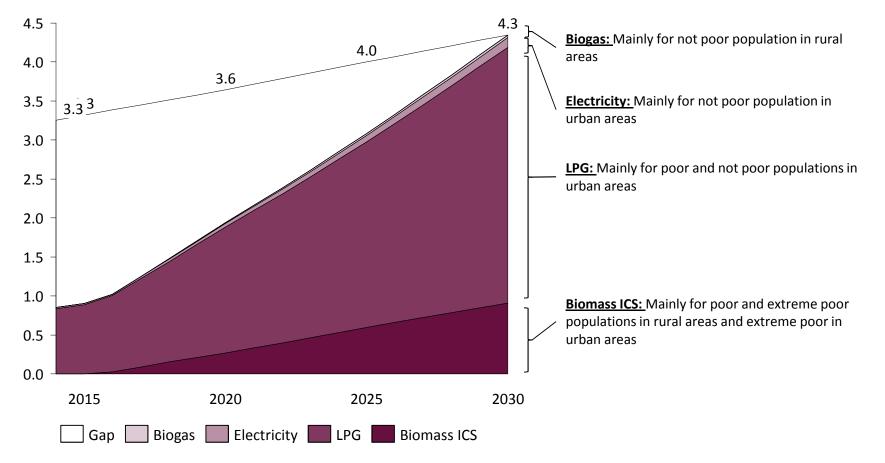
Projected evolution of cooking technologies under the Roadmap

Source: Dalberg analysis.

The Roadmap aims to close the gap by increasing the penetration of improved biomass stoves and LPG stoves

In 2030, 75% of the HH¹ will be cooking with LPG, 21% with biomass ICS and the other 4% with other fuels

Projected evolution of cooking technologies under the Roadmap (*millions of households*)



1. Does not assume transition from the population that today is cooking with Improve Cooking Solutions to other cleaner technologies. Source: Dalberg analysis.

In addition, it will significantly impact the health and household finances of those cooking with traditional stoves, as well as the emissions

Household Finances² Emissions³ Health¹ Will reduce household Will reduce deaths Will reduce emission expenditure in fuels for gases of carbon dioxide from HAP⁴ by **45,000** cooking ~40% per by almost 53 million people, including month (**US\$21**) 15,000 children (from tons (from 2016-2030) 2016-2030)



Increasing the adoption of clean cooking solutions positively impacts the household's finances and health, leading to poverty reduction and increased prosperity

1. Estimate by projecting the number of deaths that will occur with the actual ratio of deaths from HAP and estimates the new number of deaths that will occur by closing the Gap of people cooking with traditional Stoves. 2. Estimated by comparing the monthly cost of HH that buy wood and cook with traditional wood stoves vs. those using biomass ICS, LPG stoves and electricity stoves. 3. Estimated by projecting annual savings of 2.6 Dalberg 23 Tons of carbon dioxide gases for each HH that transition to an ICS. 4. Household air pollution. Source: GACC; Desk research; Dalberg analysis.

The Roadmap includes 12 Strategic Lines, 3-5 components per strategic line, and 7-9 activities per component

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		9.2.3 Eleborar regulación preliminar para GLP en Nicaragua (e.g. propiedad de tambos, vida útil de tambos, tamaños de t	amhmi) INE	MEM, D	tribuidones de GLP	Apr-16	May-16				-		-						
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-		5.1.2 Abrir proceso de selección para ejecución del estudio		Aug-15 Aug-15				- 23 - 22											
	5.1	5.1.3 Evaluar y seleccionar organización e ejecutar el estudio	Productores	Sep-15 Sep-15															
	3.1	5.1.4 Ejeratar el estudio		Oct-15 Mer-15											-				
	5.1.5	5.1.5 Socializar las lecciones aprendides del estudio con los productores de estufas mejoradas y otros actores relevantes		Apr-16 Mey-16															
	5.2	Amplación de la variedad de modelos situponibles de estudas mejoradas (e.g. biomasa, GLP, electricidad, solar)		Apr-16 Dec-30							3-10	100-10	100	1. 23	-8-88				8 A -
	5.2.	5.2.1 Definir las saracterísticas de los nuevos modelos necesarios en basa el estudio de preferencias en el diseño de estufas mejoradas (e.g. diferentias foentes de energía, más económicos, mayor vida útil, facilidad de uso y ergunomía)		Agr-16 May-16							-		-			-			
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ş <u>—</u>		5.1.2 Implementar el programa de inducación continuade (e.g. el través de talleres y seminarios) Asociación Recovables 6.1.3 Capacitar en la elaboración de planes de respecto para aumientar la producción	Productores	Apr-16 Aun-16								20 2	2.0						
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		8.2.2 Negociar con las instituciones financienas productos de crédito beneficionos para productores (n.g. tasas blandas, fechas de pago Aministerie de Economia Familia Comunitaria, Cooperativa y Asocia	r, Bancos, superintendencia, productore distribuidores	Mer-15 May-16							++		0.00		-				
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	-	6.3.1 Identificar con los productores las partes y/o materia prima que es lgual o se puede estandarizar entre los diferentes productores		Jun-16 Jul-16											-				
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The complete Roadmap can be found in the Annex

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Guatemala

- Nature of the Challenge
- Catalyzing a Transformational Change
- Needed investments to transition to Clean Cooking

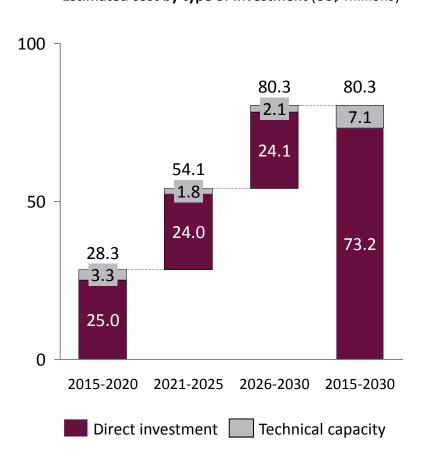
Nicaragua

Approach to investor outreach

Next Steps

US\$28 million will be necessary to implement the initiatives defined on the first five years of the Roadmap

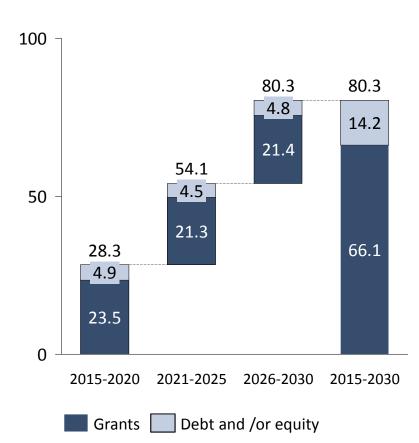
Cost by type of investment are mainly concentrated in direct investment



Estimated cost by type of investment (US\$ millions)

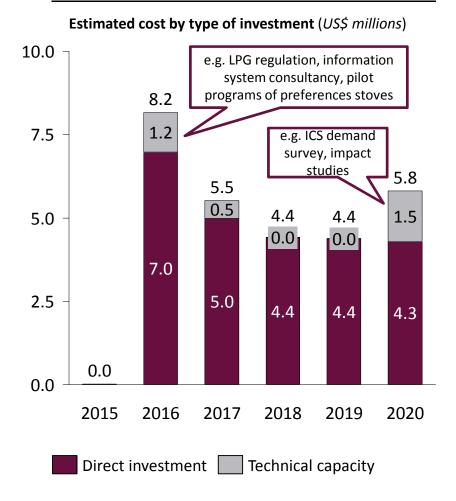
Grants are likely to make up the majority of investment needs for the Roadmap

Estimated cost by type of funds (US\$ millions)

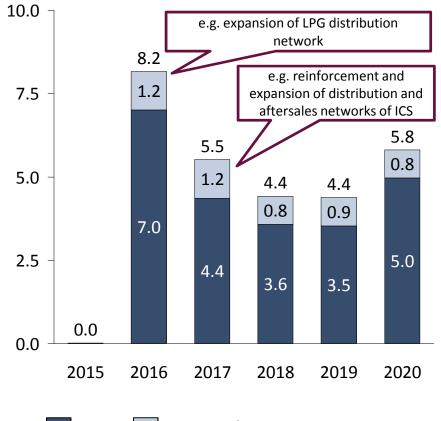


The financing needs are slightly more concentrated during 2016, which focuses on planning the initiatives further

Technical capacity is more needed during 2016 and 2020



Debt and/or equity funds are concentrated on the first years, to reinforce the supply side



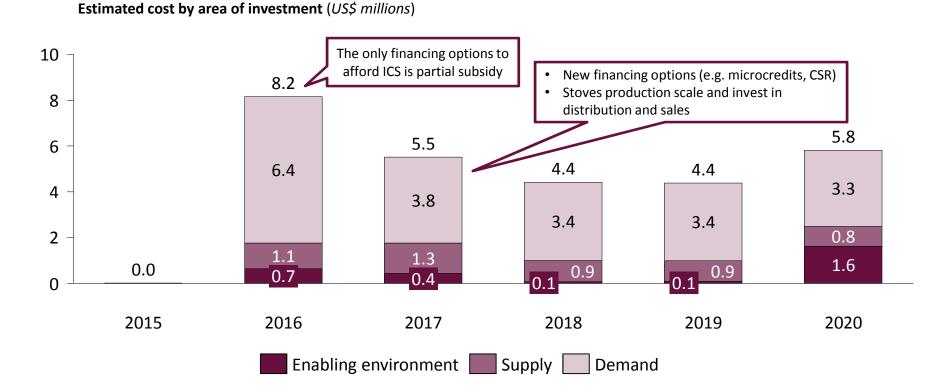
Estimated cost by type of funds (US\$ millions)

Grants Debt and /or equity

Source: Dalberg analysis.

The majority of the investment needed concentrates in strengthening the demand

Overall, the majority of the costs of the Roadmap are concentrated in boosting the demand



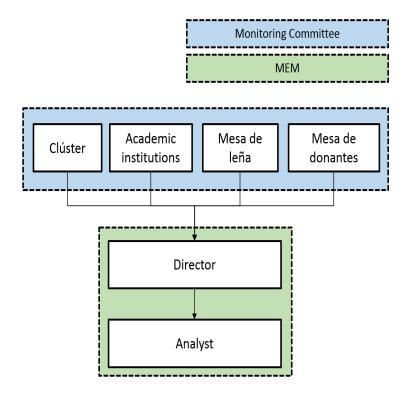
There is a clear focus on strengthening the demand of clean cooking solutions as the cornerstone of developing the clean cooking sector.

Particularly, the majority of the investment needed focuses on increasing the financing options for the consumers

	Strategic line	Investment component	Total (US\$M)			
		Include a Clean Cooking Solutions component into existing public programs				
		Include a Clean Cooking Solutions component for authorities and local leaders				
	1. Creating awareness	Include a Clean Cooking Solutions component in the national education curriculum	0.91			
pu		Launch advertising and awareness campaigns	0.60			
Demand	2. Training prospective users on how to Train the trainers of existing public programs (e.g. gender empowerment programs)					
De	install, use, maintain and fix their stoves	Train final users	0.77			
	2 Increases the financing antiput for the	Strengthen the role of the IMF through a guarantee fund				
	3. Increase the financing options for the	Implement Corporate Social Responsibility programs				
	consumer	Implement subsidies programs				
		Increase the production of sustainable woodfuel				
	4. Availability of fuel	Expand the LPG distribution network				
		Develop a study to explore the possibility of diversifying the sources of energy for cooking	0.18			
		Run pilot programs of preferences in the design of ICS	0.18			
	5. Stove design	Broaden the portfolio of ICS models through a fund for research and development	0.24			
		Train national manufacturers in best practices and managerial skills	0.01			
⊳lq	6. Stove production	Increase access to finance for producers in order to scale production				
Supply		Increase bargaining power to aggregate purchase parts and materials	0.87			
0,		Train the distributors in marketing and managerial skills	0.00			
	7. Stove distribution	Create subcontracted distribution networks and reinforce own and existing distribution networks.	0.11			
	8. Stove After-sale services	Train distributors in after-sale best practices	0.00			
		Reinforce the subcontracted after-sale networks as well as strengthen the networks own by the distributor	0.11			
		or manufacturer	0.11			
		Promote easy to activate stove warranties	0.00			
		Review the policies, regulations, norms and strategic plans that are relevant	0.04			
	9. Policies and regulation	Study the possibility of reducing tariffs and taxes to the production, import and export of stoves and fuels	0.03			
ent		Work on a regulation that incentivizes the usage of LPG for cooking	0.21			
environment		Work on a carbon offset regulation	0.10			
iro	10. Institutional support	Create a inter-sectorial support unit which owns the Roadmap, socialize, review, and monitor its	0.24			
Suc		implementation	0.24			
ي م	11. Quality standards and laboratory	Define standards and regulations, testing procedures for ICS and fuels to ensure quality	0.04			
Enabling		Set up a laboratory to evaluate and certify ICS and fuels	0.19			
Ena		Identify or create an information system able to collect all the needed subsector information	0.15			
_	12. Knowledge and data	Defining, collecting, entering and updating information on supply and demand for ICS	(1.16)			
		Do impact studies (e.g. health, environment)	0.70			
Total 28.3						

The Roadmap contemplates the creation of a support unit in charge of supervising the implementation of the Roadmap

The support unit would report to a cookstove board



The support unit would be in charge of making sure the Roadmap is successfully implemented

- Coordinate the different activities where the stakeholders participate on.
- Carry out the processes of selecting and contracting advisory and consulting firms and other technical capacity support.
- Monitor the financing needs and keep the accounting books updated.
- Compile, store and keep the need information, for the indicators and parameters of the Roadmap.
- Prepare and present the regular monitoring and update reports of the Roadmap.
- Prepare and present the ad-hoc monitoring and update reports of the Roadmap required by donors.

One of the main responsibilities of the support unit will be to monitor the progress made towards the end goal of the project

Output metrics					
% Of households in Guatemala cooking with traditional stoves (as primary or secondary stove)					
# of biomass ICS adopted					
# of LPG stoves adopted					
# of electricity stoves adopted					
# of biogas stoves adopted					

	Strategic line	Progress metrics						
	1. Creating awareness	Annual # of prioritized households made aware of the problems associated with cooking with traditional and the benefits of ICS						
σ	2. Training prospective users on how to install, use,	# of training workshops in Clean Cooking Solutions for trainers/instructors of existing public programs						
Demand	maintain and fix their stoves	Annual # of municipal ICS exhibitions						
Der		Annual # of households that access an ICS through a microcredit						
	3. Increase the financing options for the consumer	Annual # of households that access an ICS through a CSR						
		Annual # of households that access an ICS through a partial subsidies						
	4. Availability of fuel	N.A.						
	5. Stove design	Annual # of new ICS models finance through the incentive fund						
Supply	6. Stove production	Annual # of biomass ICS produced						
_ ∾	7. Stove distribution	Tatal # of ICC distribution and offer calco starse encryption						
	8. Stove After-sale services	 Total # of ICS distribution and after-sales stores operating 						
L T	0. Delicies and regulation	Policies, strategies and regulations revised						
men	9. Policies and regulation	Regulation of LPG approved						
Lon	10. Institutional support	Annual # of follow up reports of the Roadmap						
Envi	9. Policies and regulation Policies and regulation 10. Institutional support Annual # of follow up reports of the Roadmap 11. Quality standards and laboratory Annual # of biomass ICS models evaluated							
ing		% of implementation of the information system						
inabling	12. Knowledge and data	# of surveys targeting the demand for Clean Cooking Solutions						
Ē		Annual # of impact studies conducted						

Background and context on the project

Guatemala

Nicaragua

- Nature of the Challenge
- Catalyzing a Transformational Change
- Needed investments to transition to Clean Cooking

Approach to investor outreach

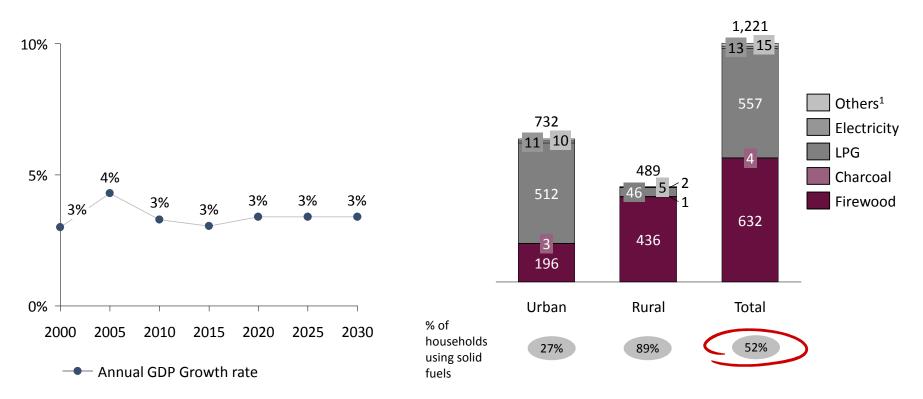
Next Steps

Despite the economic growth experienced by Nicaragua, more than 50% of their populations cook primarily with wood

Despite the economic crisis of 2008, the GDP has kept a positive trend

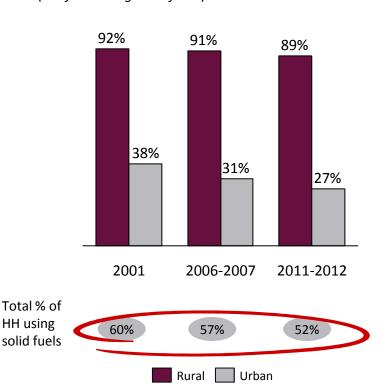
Still, 52% of the households today cook with solid fuels, primarily wood

Primary fuel usage for cooking breakdown (2011-2012) (000 households)



This % has decreased slightly in the last 15 years, particularly in urban areas

the % of HH cooking primarily with wood has barely decreased, mainly in rural areas



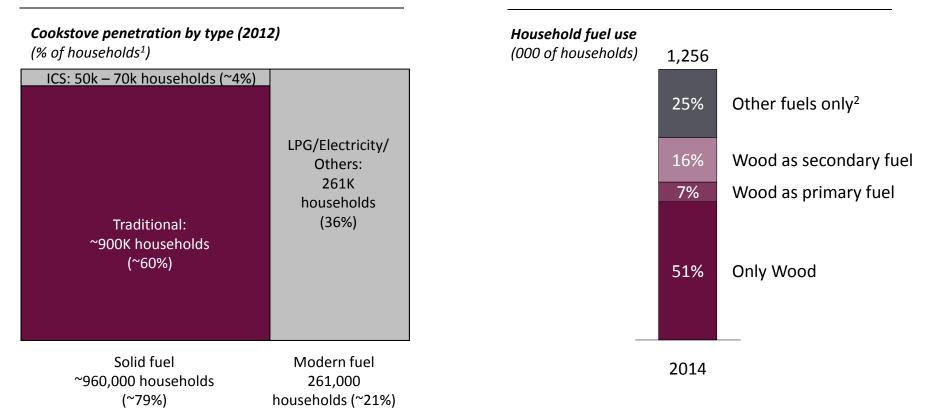
Primary fuel usage historically (% of HH using solid fuels)

Unlike other countries in the region, Nicaragua does not have a long history of public cookstove programs

- Many public institutions in Nicaragua are highly interested in promoting the adoption of clean cooking solutions, but unlike in other countries of the region this has not been translated into massive public programs focused on giving away or heavily subsidizing the stoves.
- The initiatives to promote clean cooking solutions have been mainly led by NGOs and local communities. These initiatives have been rather isolated and have had a modest scale.

Out of the ~52% HHs that mainly use solid fuels for cooking, the great majority use traditional cookstoves, although fuel stacking is significant

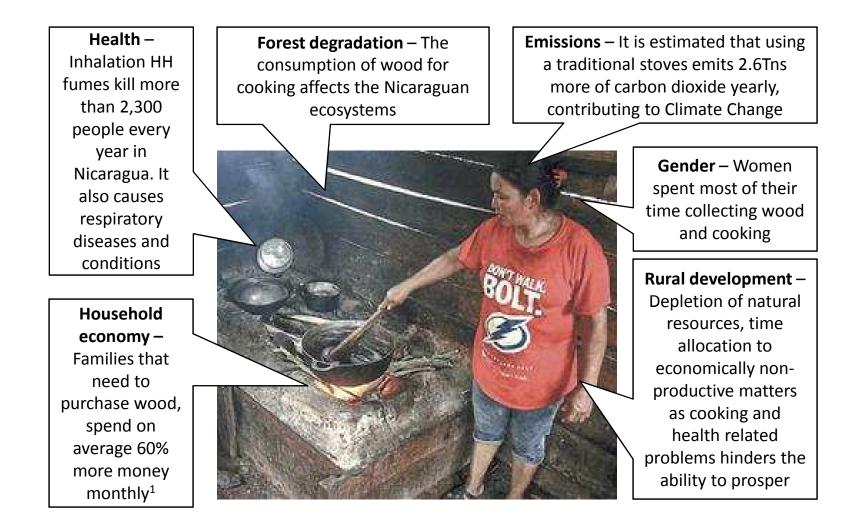
Built-in-place ICS with chimney has been the predominant ICS model (Justa model)



~23% of the population use combination

of wood with other fuels

Cooking with traditional stoves is a multidimensional problem, that severely affects 0.9 million households



A complex set of challenges has prevented Nicaragua from a broader adoption of clean cooking technologies

Demand

- Low awareness about the negative consequences of cooking with traditional stoves and the existence of alternatives.
- Limited affordability perceived due to the co-existence of several factors: market prices for cooking solutions are considered high, payment schemes and micro credits are not available, and heavily subsidized programs are reaching a significant amount of population.
- Little training received by users on installing, using, maintaining and repairing the stoves, leading to eventual breakdowns and mistrust in the technology.

Supply

- Limited availability of fuels that pushes households to use wood instead of LPG, electricity or even sustainable wood.
- Narrow variety of models that do not fully adjust at the needs of potential users.
- **Constrained productive capacity** to produce stoves at a significant scale.
- Weak distribution networks that rely on NGO and government programs to reach out users.
- Inexistent after-sale services that hinder the usage of the stoves over time.

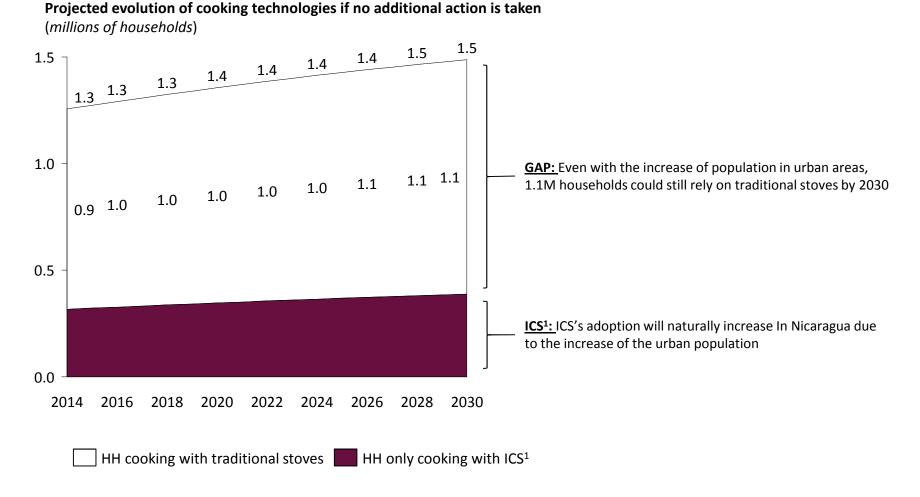
Enabling Environment

- Inadequate policies and regulations to promote the usage of cleaner cooking technologies and fuels beyond the existing National and Strategy Plans.
- Uncoordinated institutional support to align different public agencies in launching successful programs.
- Lack of quality standards that does not guarantee certain efficiency and emissions standards.
- Limited knowledge and data, that hinders effective decision making.

INSERT GAP ASSESSMENT DOCUMENT AS BACKUP

In 2014 out of the total 1.3 M households in Nicaragua, 0.9 M cooked with traditional stoves; This number could increase to 1.1 M in 2030

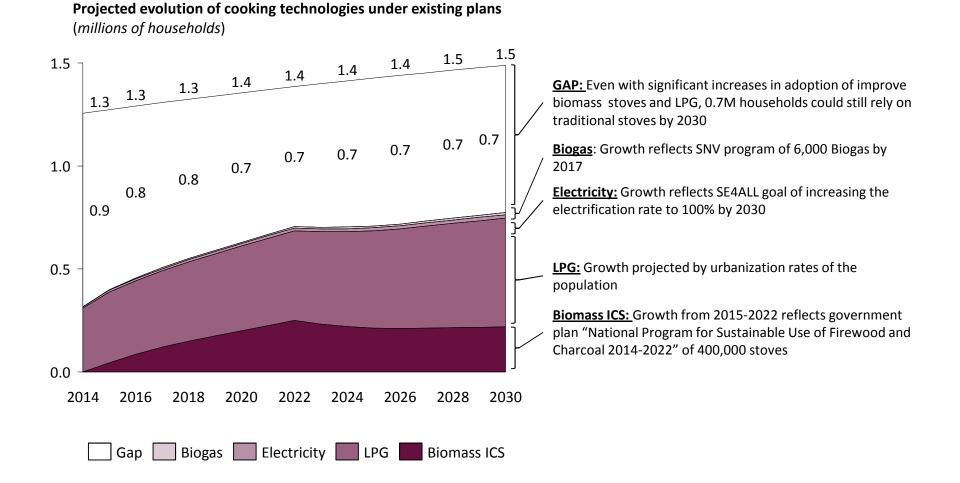
If no additional action is taken, the number of HH cooking with traditional stoves could increase from 0.9 million in 2014 to 1.1 in 2030



1. ICS includes biomass improved cookstoves, LPG stoves, Electricity stoves and biogas stoves. Source: Interviews; Desk research; Dalberg analysis.

The current plans to increase the penetration of LPG and biomass ICS are not enough: ~0.7 M households could still rely on traditional stoves in 2030

The existing government and country plans to increase the penetration of LPG, electricity and Biomass ICS will only reduce the amount of HH cooking with traditional stoves partially



Background and context on the project

Guatemala

Nicaragua

- Nature of the Challenge
- Catalyzing a Transformational Change
- Needed investments to transition to Clean Cooking

Approach to investor outreach

Next Steps

All relevant stakeholders in Nicaragua have come together to develop a holistic Roadmap

Stakeholders have participated in a series of workshops

The roadmap developed takes an ecosystem approach

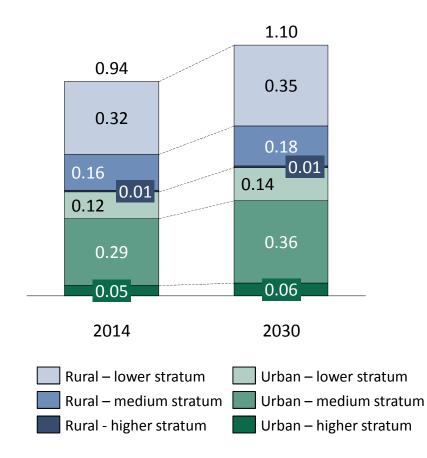


- The objectives of the Roadmap are the following:
- Demand:
 - Increase demand of clean cooking solutions
 - Increase usage of clean cooking solutions over time
 - o Diversify financing options and affordability
- Supply:
 - o Increase the variety of stoves models
 - Scale the up the production of stoves
 - Increase/reinforce the distribution and aftersales networks
- Enabling environment:
 - Ensure policies and regulations are in place
 - Enhance institutional support
 - $\circ~\mbox{Evaluate}$ and certificate stoves
 - Collect updated information and make it available

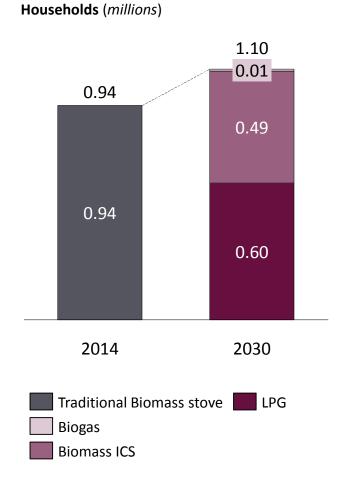
To close the gap, the Roadmap aims to transition different population segments to cleaner technologies using specific strategies

The target population can be categorized by socioeconomic strata and geography

Households (millions)



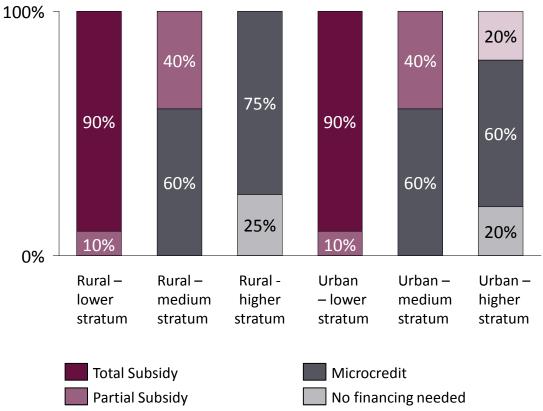
The Roadmap migrates the target population to cleaner fuels



Source: workshops; Dalberg analysis.

For instance, the Roadmap contemplates different financing mechanisms for different segments to access the technologies

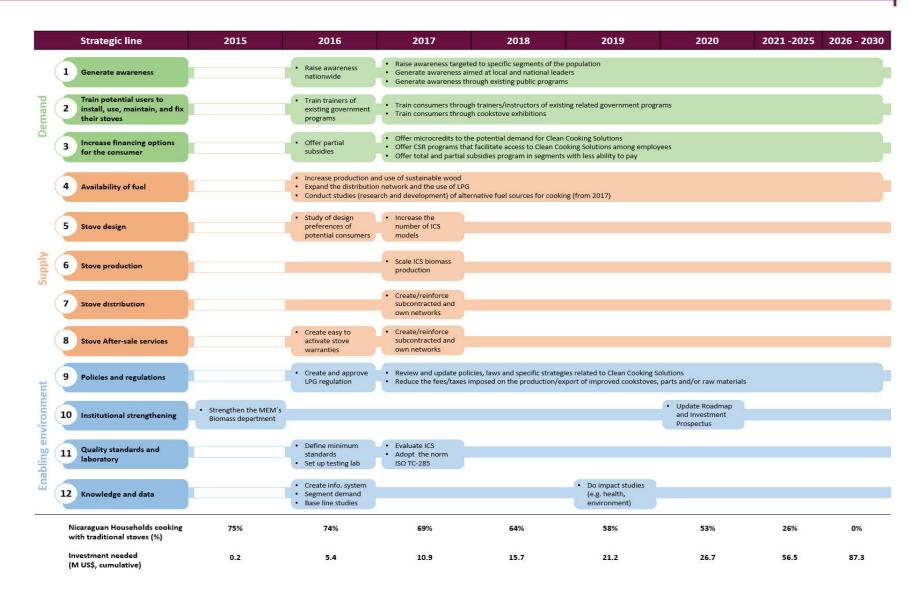
Different type of subsidies, microfinance and CSR initiatives are targeted to different segments



Corporate Social Responsibility

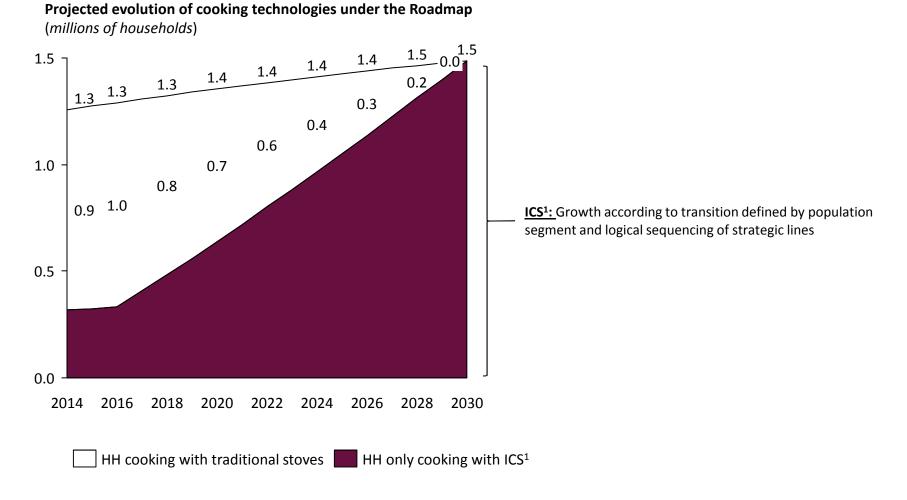
- Total Subsidy = subsidies 100% of the cost of the ICS
- Partial Subsidy = subsidies 70% of the cost of the ICS
- Microcredit = finance 70% of the cost of the ICS
- Corporate Social Responsibility = finance 70% of the cost of the ICS
- No financing needed: the HH cover the whole cost of the ICS

Recognizing that all the Strategic Lines are important, the Roadmap defines the logical sequence between them to maximize impact



The Roadmap aims to eradicate the dependency on traditional stoves and help transition all households to clean cooking solutions by 2030

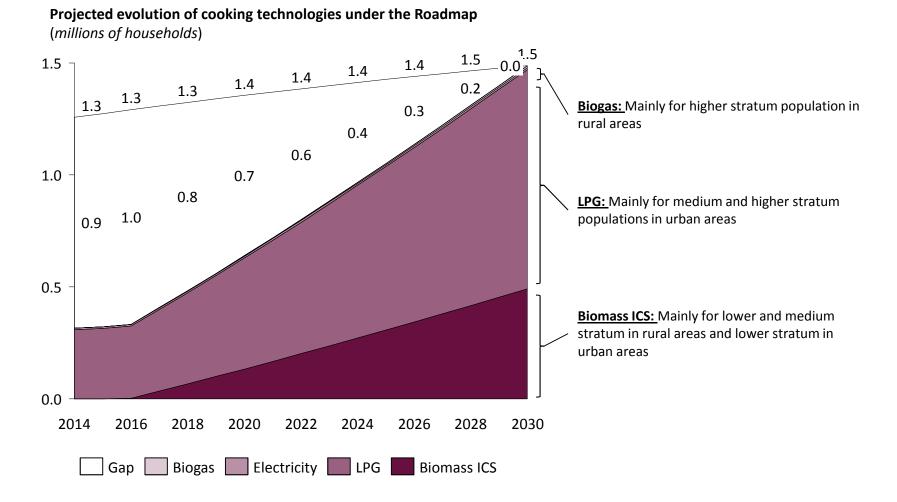
The correct implementation of the Roadmap would close the gap previously identified, and would enable all Nicaraguan households to cook with ICS¹ by 2030



1. ICS includes biomass improved cookstoves, LPG stoves, Electricity stoves and biogas stoves. Source: Dalberg analysis.

The Roadmap aims to increase the penetration of biomass and LPG stoves to close the gap of households cooking with traditional stoves

In 2030, 66% of the HH¹ will be cooking with LPG, 33% with biomass ICS and the other 1% with other fuels



1. Does not assume transition from the population that today is cooking with Improve Cooking Solutions to other cleaner technologies. Source: Dalberg analysis.

In addition, it will significantly impact the health and household finances of those cooking with traditional stoves, as well as the emissions

Health¹

Will reduce deaths from HAP⁴ by **21,000** people, including **2,500** children (from 2016-2030)

Household Finances²

Will reduce household expenditure in fuels for cooking ~60% per month (US\$34)

Emissions³

Will reduce emission gases of carbon dioxide by almost **21 million tons** (from 2016-2030)



Increasing the adoption of clean cooking solutions positively impacts the household's finances and health, leading to poverty reduction and increased prosperity

Estimate by projecting the number of deaths that will occur with the actual ratio of deaths from HAP and estimates the new number of deaths that will occur by closing the Gap of people cooking with traditional Stoves.
 Estimated by comparing the monthly cost of HH that buy wood and cook with traditional wood stoves vs. those using biomass ICS, LPG stoves and electricity stoves.
 Estimated by projecting annual savings of 2.6
 Dalberg
 Tons of carbon dioxide gases for each HH that transition to an ICS.
 Household air pollution. Source: GACC; Desk research; Dalberg analysis.

The Roadmap includes 12 Strategic Lines, 3-5 components per strategic line, and 7-9 activities per component

		12.																		
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		9.2.2 Adeptar normatives internacionaire a la realidad del país					Feb-16	Mar-15												
		9.2.3 Haborar regulación preliminar para GLP en Nicaragua (e.g. propiedad de tambos, vila últi de ta	ambos tamaños de tambos)	INE	MEM.	Natribuidores de GLP	Apr-16	May-16			8 8 8			3 5			100			
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3	5.1.3			2	Aug-15 Aug-15													\square	++++	
	5.1.5	3 Evaluar y unfeccionar organización e ejecutar el instudio	UNI	Productores	Sep-15 Sep-15						\mathbf{H}									
	5.14	A Ejecuter el estudio			Oct-15 Mer-15					TT										
	5.1.5	5 Socializar las lacciones aprendicias del estudio con los productores de estudas mejoradas y otros actores relevantes			Apr-16 Mey-15															
	5.2	Ampliación de la variedad de modelos disponibles de estudos mejoradas (e.g. biomase, GLP, electricidad, solar)			Apr-16 Dec-30						-	-8-3	3 <u>-</u> 1-2							
	5.2.1	k.3.3 Centry sectors in fordu de incentions modeles necesarios en losar el anticida de preferencias en el clarifició de estufias mejoradas filos diferencias de mengio, meioritarios de sincencias mejoradas filos diferencias de mengio, mejoradas Centry sectors un fondu de incentions e la incorrectión e incursación de estufias mejoradas (e.g. bitmase, 62.9; electribidad, turíar) (Me)			Apr-16 May-16						-									
				Productores	Apr-16 Mey-15											++		$\left\{ + \right\}$	-+++-	
1 1		3 Informar a productores las opciones de linanclamiento existentes		8	Jun-1fi Jul-16			- and - re-	0.000							08				
-	5.2.4 Ausorary facilitar el acceso a los recursos del fondo de incentivos a los productores				Jul-16 Dec-30															
•		Producción de astufas		ļ,								12	0-2-5	0-1-1-1	0-0-0-					
8 9	6.1	Capaditación e lins productores de soluciones limpias para cocinar en mejores prácticas productivas Diseñar un programa educativo para los productores de estufas mejoradas (e.g. métodos de producción, inventantos, negociación		3	Jan-1fi Dec-30		200 3	1 200 38	5-10-55-5	10 18 5	<u> </u>		_	_		4				
8	6.1.1	⁴ con proveedores, finanzas, operactores, recursos humanos)	lación Renovables	Productores	Jan-16 Feb-18 Mar-15 Mar-15					3 <u> </u>										
		Implementar el programa de educación continuade (e.g. a través de latierra y arminarios) Capacitar en la elaboración de planes de negocio para aumentar la producción	ACCO NECOVICIES	Productores	Apr-16 Am-18															
		A Adecorar en temas ad hoc:		3	Apr-16 Dec-30					2 - A - A							0000			
8 - 2	6.2	Generación de un portafolio de opciones de l'inanciemiento el productor de soluciones limpáes para cocinar			Jan-16 Dec-30															
	6.2.1	Crear y activar un fondo de garantias para apoyar préstamos a la producción de estulias mejoradas			Jan-16 Feb-16											1997	1.000			
	8.7.2	Negotiar con las instituciones financienas productos de crédito beneficionos para productores (n.g. tasas biandas, fechas de pago Ministerio	de Economia Familiar, Bancos Cooperativa y Asociativa	superintesdencia, productores, dutribuidores	Mar-16 May-16															
	6.2.5				Jun-16 Jul-16															
	6.2.4	4 Asesorar y facilitar el acceso a las opciones de financiamiento a los productores e implementadores		l.	Aug-15 Dec-30						-		-			4				
2	53	Compre agregada de partes y materia prima para la producción de estuñas mejuradas (e.g. planchas de hierro, chimereas)			Jun-16 Dec-30						-	1 18 5	1 1 5			ЦЦ.		Ш		
-		1 Identificar con los productores les partes y/o materia prima que es Igual o se puede estandarizar entre los déventes productores				Jun-16 Jul-16														
1 9			Productores		Jul-16 Sep-16		100	100 12		0 10 0										
-		³ Negociar con proveedores por compra mayoritarias que se refleje en economias de escala para los productores.		8	Oct-16 Dec-16		_							1	0-10-					
and the second second	6.3.4	4 Compres de forma agregada las partes y/o materie prima para la producción de estudías mejo rades	NT.		Jan-17 Dec-30						+++									
7	7.1	Distribución de esturies Capacitación a distribuidores de esturies mejoradas en mejores prácticas de modelos de situiticación y mercadeo	1		Jan-16 Dec-30			2 (d) (d)	201 A 2 4	3 A A	4 10 5	1 12 15	и тт	-1-18 T	-1-1-1					
2	7.1	Capacitatión a debribuidores de mitufes mejoradas en mejores prácticas de modelos de divisibución y mercadeo Indiais os amenanes admentes anos las distribuidanes de actuitos melocadas con transmiseráns espansible de distribución os		1	MIN-16 LV8C-50															

The complete Roadmap can be found on the Annex

INSERT ACTION PLAN DOCUMENT AS BACKUP

Background and context on the project

Guatemala

Nicaragua

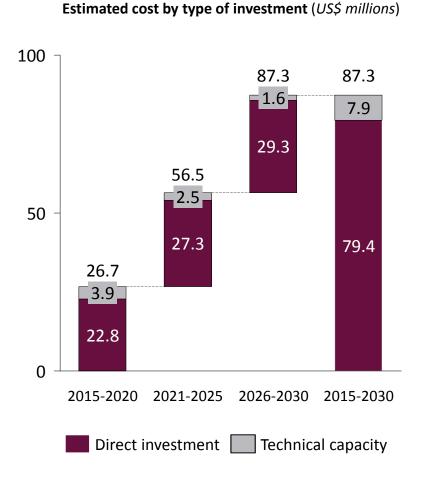
- Nature of the Challenge
- Catalyzing a Transformational Change
- Needed investments to transition to Clean Cooking

Approach to investor outreach

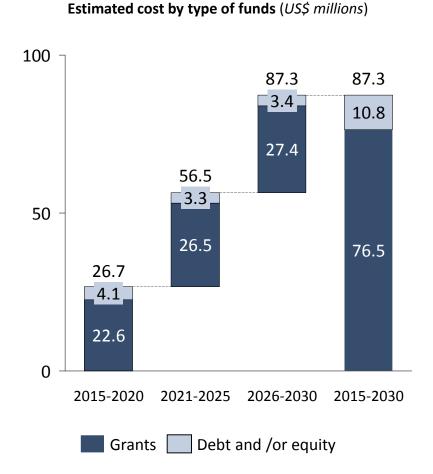
Next Steps

US\$27 million will be necessary to implement the initiatives defined on the first five years of the Roadmap

Cost by type of investment are mainly concentrated in direct investments



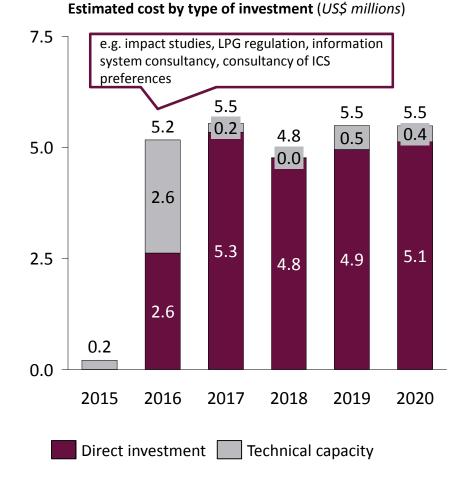
Grants are likely to make up the majority of investment needs for the Roadmap



Source: Dalberg analysis.

The financing needs for the short term are distributed among the period 2016-2020

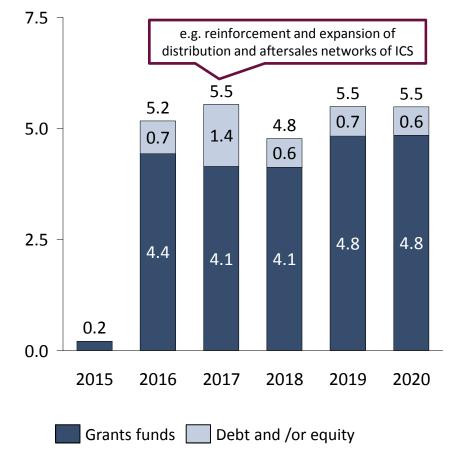
Technical capacity is more needed during 2016



Estimated cost by type of funds (US\$ millions)

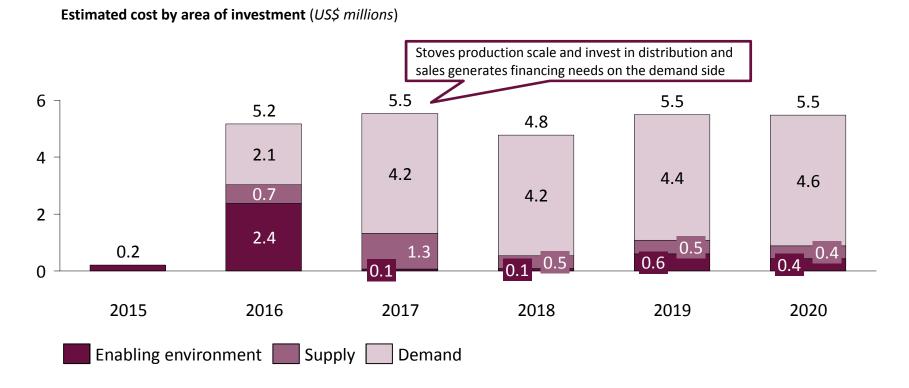
Debt and/or equity funds focused on reinforcing

the supply are concentrated on 2017



The majority of the investment needed concentrates in strengthening the demand

Overall, the majority of the costs of the Roadmap are concentrated in boosting the demand



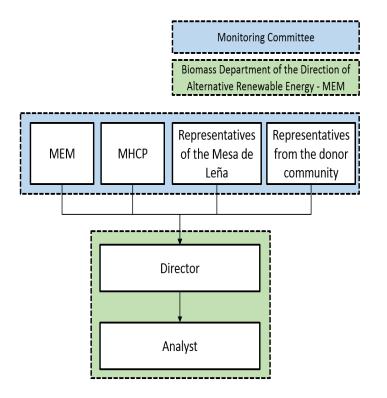
There is a clear focus on strengthening the demand of clean cooking solutions as the cornerstone of developing the clean cooking sector.

Particularly, the majority of the investment needed focuses on increasing the financing options for the consumers

	Strategic line	Investment component	Total (US\$M)			
		Include a Clean Cooking Solutions component into existing public programs	0.02			
		Include a Clean Cooking Solutions component for authorities and local leaders	0.04			
pu	1. Creating awareness	Include a Clean Cooking Solutions component in the curriculum of Elementary and Secondary Education	0.23			
		Launch advertising and awareness campaigns				
Demand	2. Training prospective users on how to	Train the trainers of existing public programs (e.g. gender empowerment programs)	0.08			
Dei	install, use, maintain and fix their stoves					
	3. Increase the financing options for the consumer	Strengthen the role of the IMF through a guarantee fund	0.22			
		Implement Corporate Social Responsibility programs	0.08			
		Implement subsidies programs	16.46			
		Increase the production of sustainable woodfuel	1.06			
	4. Availability of fuel	Expand the LPG distribution network	0.93			
		Develop a study to explore the possibility of diversifying the sources of energy for cooking	0.18			
		Study of preferences in the design of ICS	0.35			
	5. Stove design	Broaden the portfolio of ICS models through a fund for research and development	0.14			
	6. Stove production	Train national manufacturers in best practices and managerial skills	0.01			
⊳lq		Increase access to finance for producers in order to scale production	0.01			
Supply		Increase bargaining power to aggregate purchase parts and materials	0.00			
0,	7. Stove distribution	Train the distributors in marketing and managerial skills	0.00			
		Create subcontracted distribution networks and reinforce own and existing distribution networks.	0.30			
		Train distributors in after-sale best practices	0.00			
	8. Stove After-sale services	Reinforce the subcontracted after-sale networks as well as strengthen the networks own by the distributor	0.00			
		or manufacturer	0.30			
		Promote easy to activate stove warranties	0.00			
		Review the policies, regulations, norms and strategic plans that are relevant	0.04			
¥	9. Policies and regulation	Study the possibility of reducing tariffs and taxes to the production, import and export of stoves and fuels	0.03			
environment		Work on a regulation that incentivizes the usage of LPG for cooking	0.21			
onc	10 la stitution el suma ent	Create a inter-sectorial support unit which owns the Roadmap, socialize, review, and monitor its	0.70			
<u>vi</u>	10. Institutional support	implementation	0.78			
	11. Quality standards and laboratory	Define standards and regulations, testing procedures for ICS and fuels to ensure quality	0.02			
Enabling	11. Quality standards and laboratory	Set up a laboratory to evaluate and certify ICS and fuels	0.17			
ab		Identify or create an information system able to collect all the needed subsector information	0.29			
ш	12. Knowledge and data	Defining, collecting, entering and updating information on supply and demand for ICS	1.16			
		Do impact studies (e.g. health, environment)	1.05			
		Total	26.66			

The Roadmap contemplates the creation of a support unit in charge of supervising the implementation of the Roadmap

The support unit would report to a cookstove board



The support unit would be in charge of making sure the Roadmap is successfully implemented

- Coordinate the different activities where the stakeholders participate on.
- Carry out the processes of selecting and contracting advisory and consulting firms and other technical capacity support.
- Monitor the financing needs and keep the accounting books updated.
- Compile, store and keep the need information, for the indicators and parameters of the Roadmap.
- Prepare and present the regular monitoring and update reports of the Roadmap.
- Prepare and present the ad-hoc monitoring and update reports of the Roadmap required by donors.

One of the main responsibilities of the support unit will be to monitor the progress made

Output metrics							
% Of households in Nicaragua cooking with traditional stoves (as primary or secondary stove)							
# of biomass ICS adopted							
# of LPG stoves adopted							
# of biogas stoves adopted							

	Strategic line	Progress metrics				
		Annual # of national awareness campaigns				
	1. Creating awareness	Annual # of prioritized households made aware of the problems associated with cooking with traditional stove and the benefits of ICS				
σ	2. Training prospective users on how to install, use,	# of training workshops in Clean Cooking Solutions for trainers/instructors of existing public programs				
Demand	maintain and fix their stoves	Annual # of municipal ICS fairs				
Der		Annual # of households that access an ICS through a microcredit				
	3. Increase the financing options for the consumer	Annual # of households that access an ICS through a CSR				
		Annual # of households that access an ICS through a total subsidies				
		Annual # of households that access an ICS through a partial subsidies				
	4. Availability of fuel	Annual # of new hectares of sustainable woodfuel				
>	5. Stove design	Annual # of new ICS models finance through the incentive fund				
Supply	6. Stove production	Annual # of biomass ICS produced				
Š	7. Stove distribution					
	8. Stove After-sale services	 Total # of ICS distribution and after-sales stores operating 				
t	0 Delisies and regulation	Policies, strategies and regulations revised				
Environment	9. Policies and regulation	Regulation of LPG approved				
ron	10. Institutional support	Annual # of follow up reports of the Roadmap				
Envi	11. Quality standards and laboratory	Annual # of biomass ICS models evaluated				
ing		% of implementation of the information system				
Enabling	12. Knowledge and data	# of surveys targeting the demand for Clean Cooking Solutions				
Ξ		Annual # of impact studies conducted				

Background and context on the project

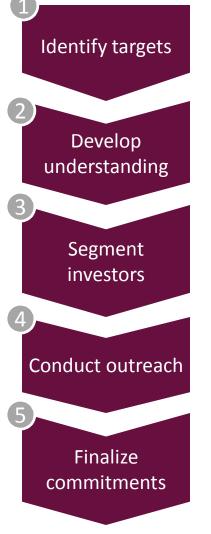
Guatemala

Nicaragua

Approach to investor outreach

Next Steps

The investor outreach strategy is aimed at delivering meaningful commitments to support the implementation of the Roadmap



- Identify existing investors within the 5 big categories (public and private sector, multilaterals, bilaterals and social investors)
- Refine the list of potential interested investors within the 5 big categories
- Conduct interviews with existing and potential investors
- Understand their funding cycles, mission, conditions and barriers to investments
- Determine the most appropriate channels to conduct outreach (e.g. summits, personal interviews, etc.)
- Create targets based on likelihood of investing and the needs/conditions of the investor
- Generate an investor "hit list" of priority investors
- Match investors in the "hit list" with investment components of the Roadmap
- Develop support material for the investors on the "hit list"
- Conduct interviews/Organize a Pledge Conference with investors on the "hit list"
- · Generate and agree on letters of understanding
- Negotiate the conditions of the investments
- Finalize the funding commitments
- Communicate the commitments to the Inter-sectoral support unit in Guatemala/Nicaragua

A wide range of stakeholders could be potentially interested in supporting the implementation of the Roadmap (I/II)

	Guatemala	Nicaragua				
Public Sector	 Ministry of Energy and Mines (MEM) Ministry of Public Health (MSPAS) Ministry on Environment and Natural Resources (MARN) Ministry of Economy (MINECO) Ministry of Public Finance (MINFIN) Ministry of Agriculture, Livestock and Food Security (MAGA) Ministry of Social Development (MIDES) Ministry of Education (MINEDUC) National Institute of Forests (INAB) National Council of Protected Areas (CONAP) 	 Ministry of Energy and Mines (MEM) Ministry of Health (MINSA) Ministry of Household Economy (MEFCCA) Ministry of Industry and Commerce (MIFIC) Ministry of Tax Revenue (MHCP) Ministry of Education (MINED) Ministry of Women (MINIM) National Institute of Forests (INAFOR) 				
Private Sector	 Jaguar Energy CentraRSE FUNDESA Cementos Progreso GoldCorp (Montana Exploradora de Guatemala) Grupo TOMZA (LPG Guatemala) 	 HEMCO (Mineria, Energía y Forestal) B2Gold El Grupo Pellas Unión Nicaragüense para la Responsabilidad Social Empresarial (uniRSE) Tropigas (LPG Nicaragua) 				
	CEMEXIntegración Centroamericana por la Responsabilidad Social Emp	resarial (INTEGRARSE)				
Multilaterals	 The World Bank (WB) The Inter-American Development Bank (IDB) Central American Bank of Economic Integration (CBIE) International Renewable Energy Agency (IRENA) Latin American Energy Organization (OLADE) 					
Bilaterals	 Dutch Development Bank (FMO) German Organization for International Development (GIZ) Canadian Agency for International Development (ACDI) Korean International Cooperation Agency (KOICA) United States Agency for International Development (USAID) 					

A wide range of stakeholders could be potentially interested in supporting the implementation of the Roadmap (II/II)

	Org	anization	Entry Point				
	tonic	The action community for global impact investing (TONIIC)	Some desire concessionary financial returns; others seek market-plus returns. Some investors commit to a specific mission focus, such as education or health care, while others embrace a broader agenda				
	Pomonalmpact	Pomona Impact	Small Growing Businesses across Central America (target firm that improve the lives of people living in the bottom of the economic pyramid and benefit the environment)				
	AGORA	Agora Partnerships	Accelerate Women Now (AWN) initiative; Invest in high-growth companies focused on solving social problems				
Social Investors	GODAL IMPACT INVESTING NETWORK	Global Impact Investing (GIIN)	Impact investments are investments made into companies, organizations, and funds with the intention to generate measurable social and environmental impact alongside a financial return				
		Omidyar Network	Education; Financial inclusion				
	root capital Proneering Finance For Rural communities	Root Capital	Empowering women; Sustaining the Environment				
	ROCKEFELLER FOUNDATION	The Rockefeller Foundation	Smart Power for Rural Development; Social Impact Bonds				
	GLOBAL ALLIANCE FOR CLEAN COOKSTOVES	Global Alliance For Clean Cookstoves	Cookstoves; Market Development				

Different channels can be used to conduct the investors outreach

Conducting personal Interviews

2/4

- Organizing pledge conference
- Attending conferences related to cookstoves's entry points



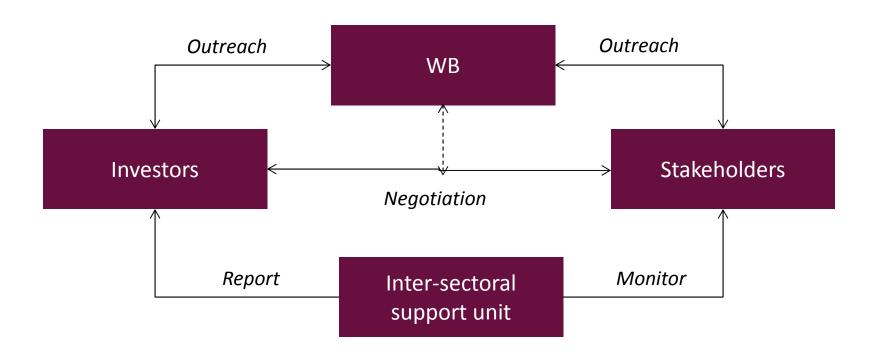
NON-EXHAUSTIVE

Optimize Potential investors can be segmented and matched to specific investment categories

ILLUSTRATIVE

Type of Investor	Area of investment	Type of investment	Examples				
Impact Investors	Supporting the supply	Equity/Debt	 Expanding/reinforcing the distribution networks Expanding the variety of stove models 				
Multilaterals	Enhancing the Enabling Environment	Equity/Debt (policy based loans)	• Developing policies to enhance the usage of sustainable fuels				
		Grants	 Funding impact evaluations, landscape studies 				
Governments	Reinforcing the demand	Grants	 Awareness campaigns Integrating cookstoves component on national education curricula 				
Private sector	Reinforcing the demand	Grants (Corporate Social Responsibility)	 Financing stoves to employees/communities of influence 				

Securing meaningful investment commitments will require alignment between the in-country stakeholders and the investors



- The WB will manage the outreach to investors and facilitate the conversations between potential donors and stakeholders, matching them based on interest and potential.
- The WB will potentially participate in the negotiations between investors and stakeholders and define investment conditions.
- Finally, the Inter-Sectoral Support Unit will act as a Project Management Office (PMO) and will be in charge of ensuring the effective implementation of the plan, the correct usage of the funds, and the reporting to the investors (unless specified by the investors).

Background and context on the project

Guatemala

Nicaragua

Approach to investor outreach

Next Steps

Dalberg 66