Cambodia Market Assessment

Intervention Options

July 2013

Introduction

- This Market Assessment was conducted by Domrei Research and Consulting Ltd., under the supervision of Nexus-Carbon for Development and Nexant, Inc.
- It is intended to provide an overall analysis of the market and opportunities for Improved Cookstoves (ICS) dissemination in Cambodia.
- Each Market Assessment has two parts:
  - Sector Mapping – an objective mapping of the sector
  - Interventions Options – suggestions for removing the many barriers that currently prevent the creation of a thriving market for clean cooking solutions.
- This report represents the Interventions Options for Cambodia.
- This Market Assessment is based on the Market Assessment Toolkit provided by Global Alliance for Clean Cookstoves, which also provided valuable input during the design of the assessment.
- The intervention strategy presented in this report is mainly based on the strategy defined by GERES Cambodia.

Content

Summary (1/2)

- Cambodia is an agricultural country located in the Lower Mekong region of Southeast Asia. It shares land borders with Thailand, Laos and Vietnam, and comprises an area of 181,035 km. Approximately 80 percent of the population lives in rural areas and 23 percent of the population lives below the poverty line. In rural areas, roughly 95 percent of households depend on biomass fuel for cooking which ensures potential future demand for improved cookstoves (ICS).

- As illustrated by the Market Assessment, Cambodia is undergoing significant energy development. The cookstove market does not seem to have reached saturation, as sales of ICS are exponentially increasing every year. Nevertheless, one of the main challenges moving forward is to **increase ICS dissemination** in order to replace the widely used traditional cookstoves.

- In Cambodia, programs to mitigate the effects of traditional cooking methods have been carried out since 1996. The entry points for these programs vary and include issues such as deforestation, cooking techniques, cookstove technology, improved biomass fuel production, and the deleterious health effects of traditional cooking. Many of these programs have been successful, and are being **scaled up and achieving some form of sustainability**.

Summary (2/2)

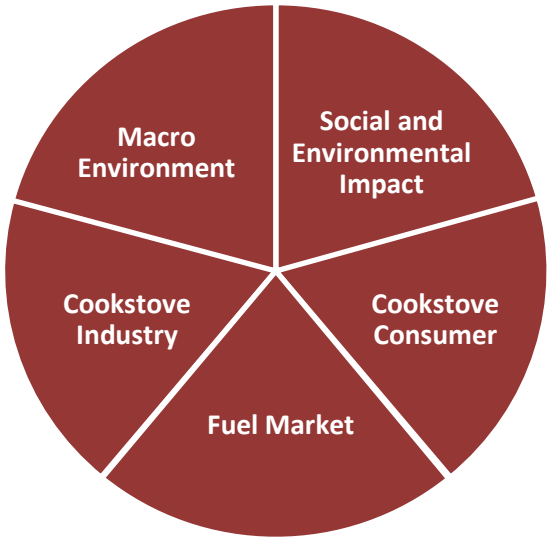
- The main challenges to scaling up in the ICS sector are:
  - Weaknesses in the upstream segment of the value chain, including business models, access to financing, market intelligence, consumer awareness, and regulatory frameworks.
  - Production and distribution processes require optimization, including R&D and product development.
- In the short and medium run, the following key actions are recommended:
  - Improve the ability of ICS producers to create business models and production plans, and access financing.
  - Conduct research into the national ICS sector, and incorporate this knowledge into strategic plans.
  - Develop and implement national ICS standards.
  - Expand ICS promotions, and educate consumers on the benefits of ICS use.
  - Develop more efficient biomass fuels (using agro-waste, sustainable firewood, etc.) and implement large-scale production.
  - Develop new, more efficient ICS models which are accepted by local end-users.
  - Improve ICS production and distribution models in order to ensure constant supply and ICS penetration in remote areas of Cambodia.

Content

Project Approach

A structured approach first assessed the market for a cookstove industry and then used the sector mapping output to develop the intervention options and relative roadmap

Sector Mapping



Sector Mapping

Focus of this Report

Strategy Development

Identify Intervention Themes → **Develop Recommendations** → **Develop Relative Roadmap**

Intervention Options And Relative Roadmap

Content

Value Chain Analysis

An analysis of the cookstove industry reveals that support is needed mainly in upstream segments. The 17-year experience of GERES with ICS in Cambodia has ensured good ICS production and dissemination techniques.

Upstream Segments

Production and Dissemination

Program Management

- Coordinate Program/Project
- Market Intelligence
- Technical Standards
- Business Development

Awareness Raising

- Gender Programs
- Social Development
- Raise Product Awareness
- Consumer Education

Production and Supply of the Stoves

- ICS Research & Design
- Test Stoves
- Train Stove Manufacturers
- Fuel Market Initiatives
- Stove Production
- Sales & Distribution

Priority of support:

- High priority
- Medium priority
- Low priority

Intervention Options Segmentation

Upstream Segments

- Business Development Support
- Market Intelligence
- Consumer Education
- Regulation & Technical Standards

Production and Distribution Chain

- R&D, Design Improvements
- Fuel Market
- Production & Training
- Sales & Distribution

Content

Business Development Support (1/2)

The main obstacle to scaling up the ICS sector is accessing finance. There is also a lack of recognition of ICOPRODAC's services. These two key points require business development support.

Challenges

- A lack of access to finance is a major concern to the ICS sector. This is especially true for new ICS producers and distributors who receive little help from private sector (e.g. MFIs, banks, etc.). It is compounded by the fact that initial investment costs are high and can serve as a disincentive to becoming involved in the sector.

- ICOPRODAC services are not well-known by ICS producers and distributors in Cambodia. These services include helping ICS management, ensuring cooperation between the different actors of the value chain, and checking quality standards and monitoring prices. They also aim to help new producers settle into their businesses.

Business Development Support (1/2)

Several solutions are being considered by GERES to make the ICS sector more autonomous. The empowerment of ICOPRODAC is one of the most important objectives in the years to come.

Intervention Options	Actions	Outcomes
1. Improve access to finance	• Find more private partners willing to help investors build their businesses. • Facilitate dialogue between private partners (e.g. MFIs, banks, etc.) and investors. • Use ICOPRODAC as a credit provider for its members and other actors in the value chain.	✓ Producers and distributors are better equipped to cope with the initial investment costs at a low interest rates. ✓ Producers and distributors have better and easier access to credit if they need to scale up or improve their business.
2. Improve ICOPRODAC's image	• Give more responsibility to ICOPRODAC. • Have GERES provide capacity building.	✓ ICOPRODAC better positioned as the main ICS sector support in Cambodia.

Market Intelligence (1/2)

Market intelligence is about anticipating the fluctuations of the market, and recording and understanding market trends. In Cambodia, the major success for the ICS sector has been its sales numbers, which have increased every year. However, some problems still persist, especially price regulation.

Demand for stoves

- Successes:
  - People are gradually replacing their traditional stoves with ICS.
  - ICS (and more specifically NLS), which were originally designed for the urban market, are now reaching rural areas.
  - ICS sales are increasing exponentially every year (NLS and NKS).
- The NKS has been designed to address the needs of rural families who could not afford to buy NLS.
- The improved economic situation in Cambodia is giving households access to new cooking fuels. Charcoal, for example, is become more affordable for some households, thereby representing a new market for ICS.

Price regulation

- Prices have fluctuated due to uneven geographical commercialization and “short-term” production business strategies. For example, some producers impose relatively high prices due to the absence of competition in their geographic area.
- ICS (especially NLS) are still considered to be expensive and unaffordable for many households, especially in rural areas.
- ICOPRODAC’s role in regulating prices is not well recognized.

Market Intelligence (2/2)

Coordination among ICS projects and their actors is limited. Any large scale ICS program should make a priority of linking with existing ICS actions to maximize efficiency.

Intervention Options	Actions	Outcomes

1. Ensure the sector's sustainability	• Assess the viability of different ICS projects: *Assessment of Cookstove Marketability and User Perception in Cambodia*
	  • Establish customer profile by gender and geographic area
	  • Share information to all involved stakeholders
	• Distinguish the causes for possible saturation, low sales, willingness to pay and the good practices to get lessons from the different projects.
		✓ Improved overview of the ICS market in Cambodia.
		✓ Projects adapted to real market demands and needs.
		✓ Lessons learned.

2. Guarantee price regulation	• Empower ICOPRODAC to ensure it enforces price regulation. • Avoid excessive price fluctuations. • Educate value chain actors in "longer-term" production strategies.	✓ Prices stabilized between a minimum and maximum, depending on the geographical area, the availability of primary resources and the demand.

Consumer Education (1/2)

The advantages of ICS, especially fuel savings, are now well-known among end-users. The informal promotion system in place does not permit to inform the end users about the benefits brought by ICS for their health and environment.

Level of awareness

- A promotion campaign for NLS has been undertaken by GERES until 2006, using different mechanisms (e.g. TV, radio, shows at the market).
- A satisfactory survey showed that only 20% of end users had heard about ICS from the GERES promotion campaign. **Most users are aware of ICS and their advantages through word of mouth.**
- NLS and NKS are now well-established and well-known in Cambodia. No further promotion is needed nor wished by GERES. Informal promotion (word of mouth) is efficient and effective.

Challenges

- Little is known about indoor air pollution among end users, and even less about environmental issues.
- Avoiding deforestation has been GERES' priority, therefore little attention has been paid to the health issues related to indoor cooking.
- The GERES promotion campaign has yet to reach the most remote areas. As a result, knowledge of ICS and their advantages is limited in remote areas.

Consumer Education (2/2)

Scaling up the ICS sector depends on the consumer perceptions. To ensure further ICS dissemination, and to increase its associated health and environmental benefits, ICS promotion and education should be prioritized.

Intervention Options	Actions	Outcomes
1. Expand ICS promotion through formal and informal communication	• Conduct formal and informal education and promotion campaigns, especially in areas where ICS are not well-disseminated. • Involve Ministries in projects, with meetings on a regular basis.	✓ New market possibilities supported by higher levels of consumer awareness.
2. Promote all of the advantages of ICS	• Include health and environmental issues (alongside fuel savings) in awareness building initiatives.	✓ New market possibilities supported by higher levels of consumer awareness.
3. Follow up on consumer needs and the level of consumer satisfaction	• Conduct regular consumer surveys about ICS use and the promotion/education campaigns.	✓ More informed ICS designs and promotion/education campaigns.

Regulation & Technical Standards (1/2)

Upstream Segments

ICS production standards exist in Cambodia and have been established by GERES. These standards have little legal significance and do not comply with GACC standards for ICS.

Stove production standards

ICS standards set up by GERES provide key requirements for the production of the New Lao Stove and Neang Kongrey Stove. These standards cover production techniques and stove characteristics (e.g. dimensions, clay quality). ICOPRODAC, the association of ICS producers and distributors, is in charge of enforcing these standards. If a stove meets the standards, a label is attached to it, helping to prove its quality.

These standards are not legally binding. It is up to government authorities to make the standards and their enforcement more formal and compulsory.

The creation of these national standards will help ensure quality control and build consumer confidence. It will also be important to avoiding “copycat” production.

Regular testing of ICS

Quality controls testing is conducted every four months by ICOPRODAC, with support from GERES. The process is long and difficult because ICS production is so decentralized in Cambodia.

DNV conducts verification of certain ICS every year as part of carbon projects (the carbon credit crediting period ended in May 2013).

Source : Stakeholders Interview

Regulation & Technical Standards (2/2)

The scaling up of ICS production requires that production standards are well established. Regular checks should still be conducted. The credibility of the entire value chain depends on stove quality, which itself depends on standards.

Intervention Options	Actions	Outcomes
1. Promote national ICS standards	• Establish national ICS standards through cooperation between the Ministry of Industry, Mines and Energy (MIME), the National Institute of Standards of Cambodia, GERES and ICOPRODAC. • Ensure a common understanding between all actors to guarantee high quality standards and ways to check them.	✓ A draft text about Energy Efficiency Policy has recently been approved by the government:, including biomass energy and ICS, giving standards for ICS and charcoal production.
2. Implement and enforce the standards	• Identify an implementation/enforcement authority. • Train this authority. • Promote ICS standards by showing the benefits of ICS as compared with traditional stoves.	✓ MIME provided the authority to enforce quality standards. ✓ MIME staff trained by GERES. ✓ “Copycat” producers switch to ICS production.
3. Carry out regular checks on standards and product quality	• Increase the capacity of existing production sites (instead of increasing their numbers) • Conduct capacity building for government and ICOPRODAC staff to ensure they understand how to evaluate product quality and compliance with the standards.	✓ Improved quality control processes.

Content

R&D, Design Improvements (1/2)

There is a wide range of traditional, ICS, and modern cookstoves available in Cambodia. The use of modern cooking equipment (e.g. LPG and electricity) is increasing, but limited to urban and peri-urban areas. Biogas has also become increasingly available, through dissemination programs and financing by SNV.

Most Common Traditional Cookstoves

Most Common Improved Cookstoves

Modern Cooking Equipment Used in Cambodia

R&D, Design Improvements (2/2)

Regular improvements have been made to ICS, due to continuing R&D and field tests, and user satisfaction surveys conducted in 2006 and 2007. However, more can be done to address users' needs, improve the efficiency of available ICS models, and develop new ICS. Appropriate testing facilities for ICS and biomass remain limited.

Intervention Options	Actions	Outcomes
1. R&D: Increase available R&D facilities	• Establish Regional Testing and Knowledge Centers in Cambodia, which will expand the scope of the sector, and provide significant benefits.	✓ Clearly defined set of standards and requirements for ICS models. ✓ R&D support for improving existing ICS, and design of new models. ✓ Technical support for smaller countries (Laos, Myanmar, etc.)
2. Improve existing ICS design and market acceptability	• Conduct comprehensive field research on cooking habits and practices. • Test the performance of existing ICS. • Modify ICS to perform efficiently for local cooking habits.	✓ Improved R&D and new stove designs. ✓ Improved existing ICS models.
3. Design new ICS models	• Conduct comprehensive lab and field research into the feasibility of new ICS designs. • Test pilot models in real world conditions, to ensure suitability and acceptability of design by Cambodian households.	✓ New ICS models which offer increased fuel efficiencies, lower emissions, and improved market share.

Fuel Market (1/2)

Production and Distribution Chain

As Cambodia moves from a dominant single cooking fuel (wood) country to a mixed fuel country, the opportunities arise for new and innovative types of fuels, as well as more efficient production and use of existing cooking fuels.

Available Fuels

Although firewood is still the most common cooking fuel throughout Cambodia, especially in rural and peri-urban areas, its share of the market is decreasing due to deforestation. Costs for all cooking fuels are set to rise as charcoal and LPG displace collected firewood in these areas, increasing the need for more efficient fuels and cookstoves across all sectors of society. This situation presents opportunities for innovative actors to "get in on the ground floor" of the Cambodian cooking market as it expands rapidly in the coming years.

Market Segmentation and Sizing by Main Type of Fuel

(Number of Households)

Type of Area	Households	% Firewood	% Charcoal	% LPG
Urban (2010)	521,000	28%	21%	49%
Peri-urban* (2013)	n/a	40%	20%	40%
Rural* (2013)	2.3 million	78%	6%	12%
National (2010)	**2.8 million**	**79.3%**	**8.7%**	**11%**

Source: CDHS 2010; Domrei Household Survey 2013

Fuel Market (2/2)

Production and Distribution Chain

Although the use of modern fuels is increasing in Cambodia, firewood will remain a significant fuel in the mid-term, and charcoal is set to replace much of the firewood use over the next decade. The difficulty in supplying rural areas with modern fuels provides opportunities for cleaner, more efficient local biomass fuel production. GERES is currently working on agro-waste briquettes and improved charcoal production processes.

Intervention Options	Actions	Outcomes
1. Develop innovative and more efficient ways to produce cooking fuels	• Conduct feasibility studies to understand the availability of alternative fuelstocks (rice husk, coconut shell, etc.), and the needs of the local markets and their ability to pay. • Undertake technical R&D, to develop efficient production methods, and train local producers.	✓ Cleaner and more efficient cooking fuels are available and adopted by the local market. ✓ Production is local, and sustainable through sales.
2. Support the creation and development of local woodlots and community forests	• Support local communities to register their local forests. • Provide training on sustainable forest management techniques, as well as education and monitoring support for the protection of forest stocks. • Support the establishment of local supply chains for community forest products, and a certification system to verify these products.	✓ Sustainably managed forests provide an increased amount of firewood and charcoal demand. ✓ These forests provide income and support for local community livelihood improvement.

Production and Training

There are a number of barriers to increased production. Small-scale producers use a "just-in-time" demand model. This short term business model decreases their ability to capitalize on market cycles and prepare supply equal to demand. Producers are still reluctant to focus only on the ICS, and continue making traditional stoves, dividing their resources and manpower. A network of ICS producers already exists.

Intervention Options	Actions	Outcomes
1. Assess current ICS production capacities	• Assess existing production infrastructure. • Map ICS producers and assess their abilities to scale up production. • Study the reasons behind why producers are reluctant to only make ICS.	✓ Understanding of current ICS production capacities and resources. ✓ Identification of barriers to increased production, and ways to address them.
2. Improve ICS production models	• Train ICS producers on increased production capacity models. • Train ICS producers on the development of longer-term business model strategies. • Encourage investment for producers to scale up successful ICS models.	✓ Increased production capacities. ✓ Improved business models allow producers to successfully focus resources on ICS production, increasing profit and ICS output.

Sales and Distribution

Production and Distribution Chain

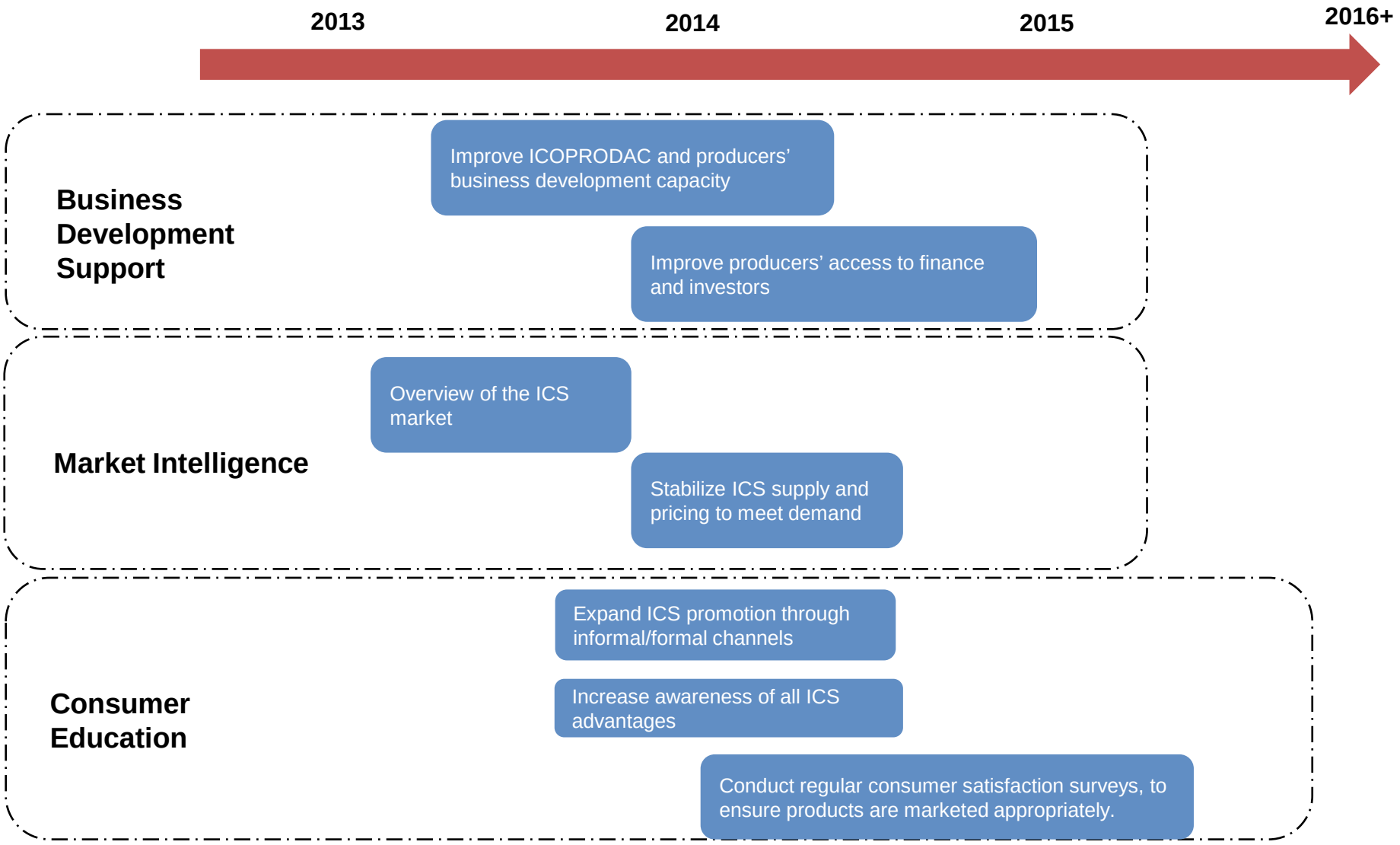
Although ICS sales are significant, most of these sales are in urban and peri-urban areas. Uneven regional production and frequent shortages cause higher ICS prices, delays and lowered confidence among end-users. The supply chain has not penetrated all parts of the country; distribution in rural areas (where biomass use is highest) is especially weak.

Intervention Options	Actions	Outcomes
1. Widen ICS production and distribution channels in rural and hard to access areas	• Identify areas where ICS coverage is least effective. • Encourage establishment of new producers and distribution channels in remote or under-served areas. • Support mobile ICS sellers to access remote areas.	✓ Comprehensive mapping of ICS distribution and supply chains nationwide. ✓ Weaknesses in the national supply chain are identified. ✓ ICS production and distribution is expanded to cover all areas of the country.
2. Improve ICS supply levels and consolidate supply chains	• Establish a call center to monitor current ICS production. Provide this information to the producers' association, so they can manage stock levels. • Establish warehouses in urban centers, to centralize ICS supplies, and improve communication between ICS producers, wholesalers and distributors.	✓ ICS stock levels are consistent year-wide, and fulfill demand effectively. ✓ ICS stock are available at central locations, and dispersed efficiently.

Content

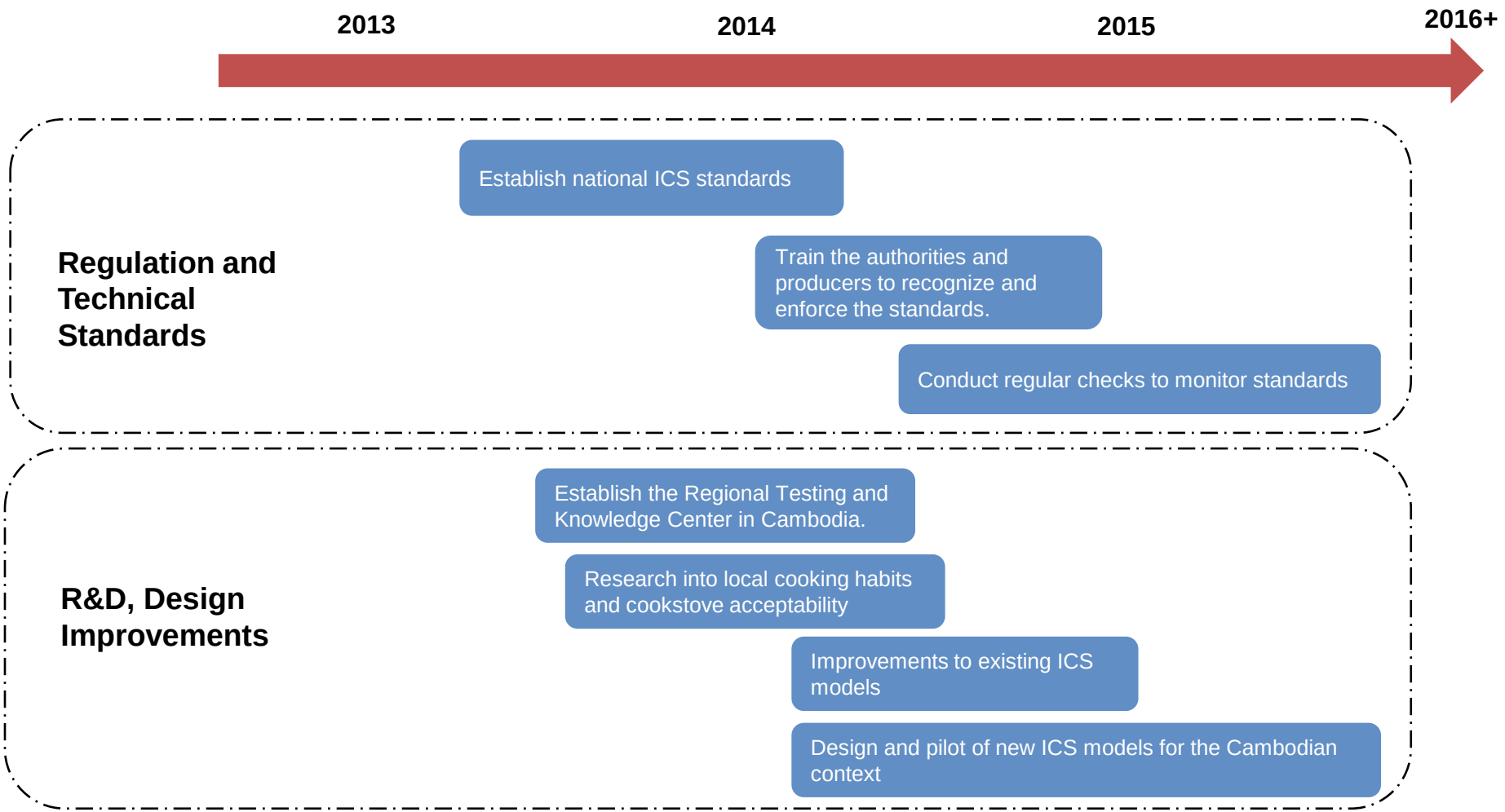
Intervention Roadmap (1/3)

The immediate phase of ICS interventions should address the long term ICS development needs, improving producers' access to markets and financing.



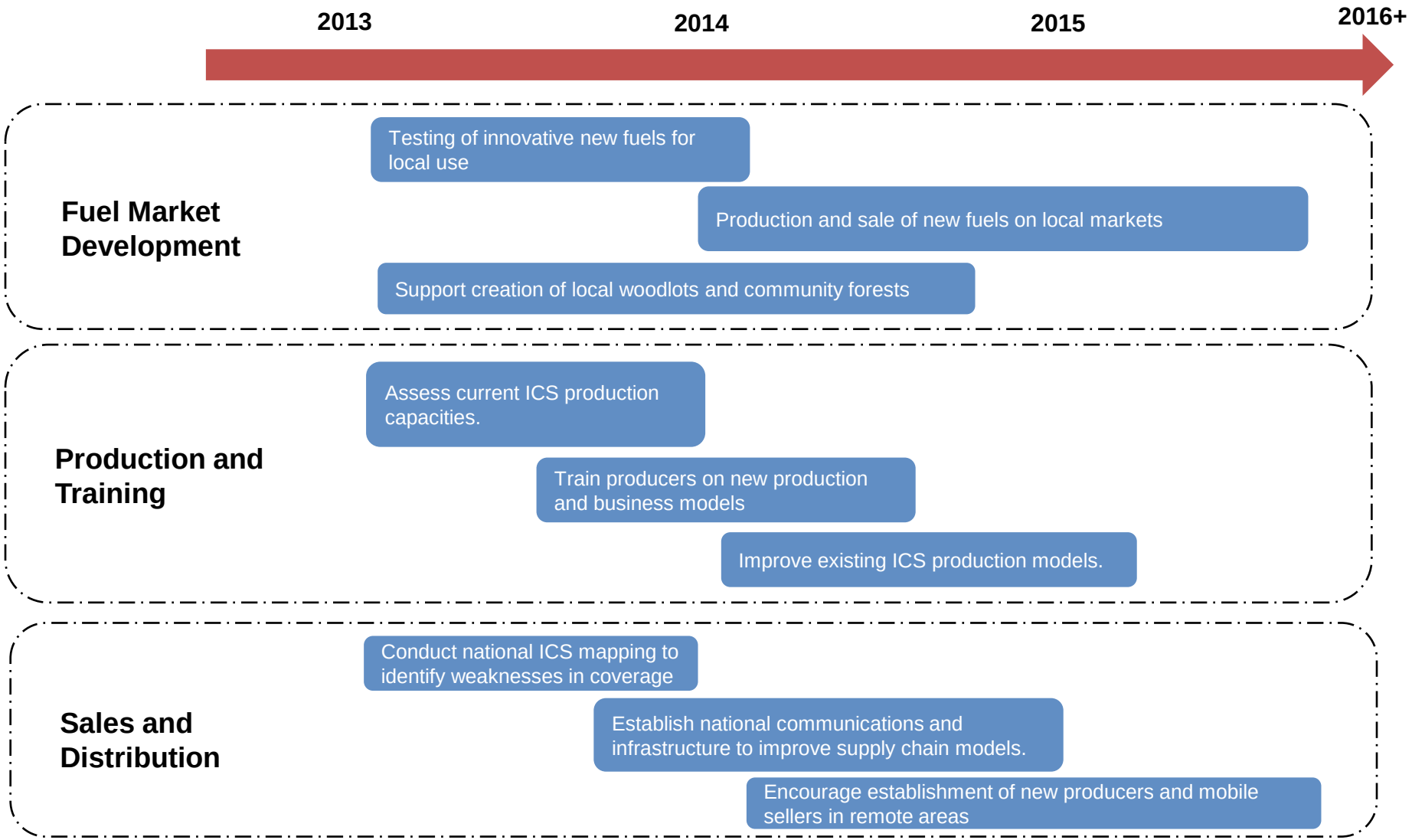
Intervention Roadmap (2/3)

At the same time as business development, the national framework can be established. Existing ICS can be upgraded and new models designed and piloted.



Intervention Roadmap (3/3)

After research, development and national support, the production, sale and distribution of innovative ICS and biomass fuels is able to proceed efficiently.



Acknowledgments

This market assessment was conducted by Domrei Research and Consulting Ltd., under the supervision of Nexus-Carbon for Development and Nexant, Inc. The assessment also received support from the Global Alliance for Clean Cookstoves, who generously provided their Toolkit Templates and Information Guidance Notes, Cambodia stakeholder lists and PowerPoint templates for use in this study.

GLOBAL ALLIANCE FOR CLEAN COOKSTOVES

Domrei Research and Consulting
Meaningful research for policy and action

nexus
Carbon For Development

Nexant