

Regional Guidelines

10 Steps for National Government Actions for SLCP Reductions Through Policies, Capacity Building and/or Institutional Strengthening

(deliverable 10)

Policy Advocacy Network for Latin America
for Clean Brick Production
(PAN LAC)

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Background and Context

The following document consists of Regional Guidelines for National Government Actions for SLCP Reductions Through Policies, Capacity Building, and/or Institutional Strengthening for the Policy Advocacy Network for Latin America for Clean Brick Production (the PAN LAC)—henceforth *The Guidelines*, comprised under the *Bricks Initiative* of the Climate and Clean Air Coalition.

This document complies with Deliverable 10 of the PAN LAC to the CCAC as established by contract between the CCAC and the Center for Human Rights and Environment (coordinator of the PAN LAC) under the oversight of the Institute for Governance and Sustainable Development (IGSD).

This document should be utilized in conjunction with the *other* evolving products of the PAN LAC network, developed under this same project cycle, including:

- [Framework Document of the PAN LAC](#) (developed in late 2014)
- [Regional Strategy of the PAN LAC](#) (late 2015)
- [Compilation of Existing Policy Frameworks](#)
- [Capacity Building Course for Public Policy on Brick Production](#) (late 2015)

It is also important to note that these strategic documents of the PAN LAC are *first edition* documents in evolution and are being modified as the PAN LAC advances into subsequent stages and continues to draw experience and input from local government activities and programs involving the traditional brick sector. The initial drafting of these Guidelines in the first half of 2016 will further be informed by PAN LAC project implementation in 2016, 2017 and 2018, and hence content of these Guidelines may vary. As such, Guideline contents are not meant to be *definitive* recommendations for addressing the traditional brick production sector, but rather they are *evolving* guidance provided to governments and other actors as the CCAC's initiatives to promote more sustainable traditional brick production learn from practice.

Further, as these documents are building blocks that have been devised during a project that is still in evolution and as they have been prepared in conjunction with diverse project components being developed at a common time, there may be some content repetition between documents. This is *intentional* and in some cases advisable. For example, the [Capacity Building Course](#) guidance was designed in consideration of the PAN LAC's [Regional Strategy](#). Likewise, these *National Guidelines* also draw pointedly from the [Regional Strategy](#).

In sum, these Guidelines should provide public officials of agents of all jurisdictional levels working to address climate change, working to address the reduction of short life climate pollutants, and particularly to reduce emissions from traditional brick production, with strategic and practical considerations they will need to carry forth public sector actions in traditional brick production sector.

Objective and Overview of the Guidelines

These Regional Guidelines for National Government Actions to Address Short Life Climate Pollutant Reductions in the Traditional Brick Manufacturing Sector (henceforth, *The Guidelines*), are aimed at providing public officials with a general overview and technical guidance for promoting more effective public policies at the national, regional and local level, and are intended to help public officials consider how best to order strategic thinking and plan out intervention strategies to:

- better understand the different policy dimension of contamination from traditional brick production;
- strategically order government agencies and actors to approach reforms in the sector;

- to better devise public policies and action plans to more efficiently address the sector.

The Guidelines have the ultimate objective of assisting governments at all levels to work towards transformative public policies and programs to promote clean brick production reducing contamination from short-life climate pollutants such as black carbon, and other climate contaminants. *The Guidelines* can be a useful tool to develop policy strategies to promote emissions reductions from traditional brick production, to develop strategies to improve economic efficiency of the sector (which can in turn also reduce emissions), and develop strategies to reduce social and environmental externalities caused by traditional brick production (an added by product value of engaging the sector).

If you are reading this document you are probably a public official, the assistant of a public official, or you are working for a public official or for a public agency that is considering or that is tasked with addressing contamination from traditional brick production. You have likely come to this issue because it has suddenly become a priority of your government, or of the agency of government you work for, either because of evolving climate change and air quality standards and public policy priorities that are under your jurisdiction, or because some aspect of traditional brick production is causing detrimental consequences either to the local environment or to people and communities living at or near traditional brick kilns.

You should find useful information in these *Guidelines* to order your thinking, to help you understand the driving and defining dynamics of the brick sector and how it might be related to public policy choices, and to think through and devise a logical step-by-step procedure to address the challenges that you will likely confront if you want to engage this sector towards emissions reductions.

Links to other CCAC Initiatives and Resources Useful to Develop Public Policy

These *Guidelines* are a product of a series of activities and initiatives sponsored by the *Climate and Clean Air Coalition (CCAC)*, a multi-stakeholder coalition under the UN family and coordinated by a Secretariat lodged in the UN Environmental Program, which have been developed with a view to address the need to reduce [Short Life Climate Pollutants \(SLCPs\)](#) such as Black Carbon, Methane, Tropospheric Ozone, Hydrofluorocarbons (HFCs). The CCAC currently has a series of [initiatives](#) underway, in a diverse set of issues such as Waste Treatment, Diesel Fuels, Transport, Agriculture, and others, which can also help your government consider SLCPs on a broader scale, through a more holistic, cross-sector and strategic approach to SLCP reduction. It is likely, particularly if you are a public official tasked specifically with climate change mitigation and adaptation, reducing emissions from industry and targeting air quality standards, that you can benefit from many of the other programs and initiatives currently underway through the CCAC.

In terms of the Traditional Brick Sector, and initiatives focused on emissions reductions from this sector, through its [Bricks Initiative](#), the CCAC has a wealth of information, gained knowledge, expert contacts and networks, technical and analytical tools, reports and other useful resources, including ongoing projects currently under implementation which can also be of use to you and to your various government agencies, to tackle the complexities and multiple dimensions and challenges (economic, social and environmental) of embarking on efforts to make traditional brick production more efficient and sustainable. Some of these include training materials for brick producers, environmental emissions measurement techniques and protocols, economic studies of the sector, as well as established networks of public officials that regularly meet and exchange information on their own experiences addressing the traditional brick production sector.

Five very useful and free resources that are ongoing CCAC projects related to brick production and that are likely to be (or that can be) integral parts of your eventual traditional brick sector strategy are:

1. *Training Nodes / Training Manuals, already being piloted* in Colombia, Mexico, Peru, Chile and Brazil to develop a common understanding and comprehensive guidance on technologies that reduce SLCP emissions from brick kiln production. More information on Training Nodes at: <http://www.unep.org/ccac/Initiatives/ImprovedBrickProduction/TechnologyTrainingNodesandTrainingManuals/tabid/794082/Default.aspx>
2. *A Study of the Business Case for Brick Production, involving* the development of the business for the complete chain of artisanal brick production – from gathering raw materials, labor organization, production processes, and distribution channels, to the final sale. More information on the Business Case, see: the [Climate and Clean Air Coalition \(CCAC\)](#)
3. *A Market-Based Pilot Project, aiming to* implement an integral kit of policies, including command and control measures (relocation, emission standards, construction regulations, etc.) as well as economic instruments (social aid programs, credit, subsidies, technology transfers, fiscal exemptions, emission market schemes) and market instruments (labeling, certification, public information, public purchases). Pilot efforts would include working with city or local governments and private or industry sector entities to promote a cleaner production and possibly the certification of bricks. More information on the Market-Based Pilot Project, see: the [Climate and Clean Air Coalition \(CCAC\)](#)
4. *A Climate Accounting / Measurement Tool, being developed* in Colombia to help characterize the brick-making sector at the country level, allowing policy makers to make first order assessments of problems related to brick production. More information on the Climate Accounting Measurement Tool: see: the [Climate and Clean Air Coalition \(CCAC\)](#)
5. *The Policy Advisory Network for Latin America to Promote Clean Brick Production (PAN LAC)*. A network of public officials and other actors that regularly meets and exchanges information about their experiences with addressing and devising public policy challenges and programs to address emissions reductions in the traditional brick production sector; These Guidelines are a direct product of *the PAN LAC*.

Finally, it is important to note that these *Guidelines* are an integral component of a series of other similar products developed by the PAN LAC, which are also geared to promoting more efficient public sector policies to address emissions reductions from the traditional brick sector. These Guidelines should be considered as an integral and complementary part to these resources, including:

- The PAN LAC Expert Network – [contact: the [Climate and Clean Air Coalition \(CCAC\)](#)]
- The PAN LAC Framework Policy
<http://wp.cedha.net/wp-content/uploads/Framework-Document-PAN-LAC.docx>
- The PAN LAC Regional Strategy
<http://wp.cedha.net/wp-content/uploads/Region-Strategy-and-Report-PAN-LAC-Dec-22-2015.pdf>
- Compilation of Existing Policy Frameworks
<http://wp.cedha.net/wp-content/uploads/Compilation-of-Existing-Policy-Frameworks-PAN-LAC-DRAFT-May-2015.pdf>
- The PAN LAC Model Capacity Building Course
<http://wp.cedha.net/wp-content/uploads/Capacity-Building-Course-Design-DEC-2016.pdf>

Only through a full and integrated approach to engaging the traditional brick production sector with a view to reducing short life climate pollutant emissions through innovative reforms across sectors, devising policies and programs to address each critical source of emissions, can real and sustainable progress be made to achieve emissions reductions and sustainability of the sector.

For more information and resources regarding traditional brick production please see the CCAC's Bricks Initiative at: <http://www.unep.org/ccac/Initiatives/ImprovedBrickProduction/tabid/794080/Default.aspx>

Further resources are available through the CCAC. Please see: <http://www.ccacoalition.org/en>

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Below you will find information that will be useful for your agency and/or government to develop a comprehensive intervention in traditional brick production, with a view to lowering emissions and promoting a more sustainable and equitable environment. They are organized in 10 distinct steps, which may be considered independently, as needed, or considered comprehensively.

Step 1: Know Your Bricks

[a more detailed description of the brick sector is available in the [PAN LAC Regional Strategy](#) document]



Black Carbon and other global green house toxic fumes are a common byproduct of inefficient brick production

Perhaps surprisingly, many government officials that are now setting out to tackle contamination from traditional brick production are surprised to discover that the public sector “formally” knows very little about the sector, even basic data about “where” traditional bricks are produced, how many kilns are operating, and other basic data about the nature and characteristics of production. If you are a public official now beginning to address contamination from bricks and you are starting with little or no knowledge about the sector or specifically about emissions from the sector, you are not alone. Others like you have started in a similar situation and have nonetheless been able to devise and implement successful strategies to reduce brick kiln emissions. Countries such as Colombia, Brazil, Argentina, Chile, Peru and Mexico, have taken specific steps in this direction and currently house learned knowledge that is presently shared through initiatives such as the CCAC.

Bricks for household and commercial use have been produced for many hundreds, and even thousands of years. The process for producing bricks is rather straight forward and generally involves utilizing clay extracted from nearby land, molding the clay into the desired brick or tile form, drying the raw brick/tile under the sun or in kilns (ovens), and then cooking the brick in a makeshift temporary oven built of the same bricks being cooked (*clamp* or *scove* design), or in a permanent oven structure, utilizing available wood or other biomass as fuel. In certain cases, waste (including toxic waste such as car tires) is sometimes used as fuel.

Traditional brick production is also oftentimes a seasonal activity where land used for agriculture or for some other activity is temporarily used for brick production. Since brick ovens are built from the very bricks that are being produced and that will be sold to market, makeshift kilns can appear out of nowhere, and then be dismantled immediately after cooking so that bricks can be sent off to buyers. This dynamic adds to the difficult task of formally inventorying the number of kilns (which would help formalize the sector) or establishing the location of kilns, as they can only be counted when they are actually in production. A kiln operated by a producer may be at one location at a given moment, and then because of a land use decision (for example and obligation to move), the same producer may construct the next kiln down the street, in another neighborhood or in an entirely different town. Not all kilns are temporary in nature. More advanced designs introduce permanent structures. A single producer may construct anywhere from a few to a few dozen kilns per week or per month. When production is underway, a neighborhood may be overrun by kiln smoke from hundreds of kilns burning at once, whilst in non-production times, the skies might be crystal clear and no kilns may be in sight.

As we learn more and more about traditional brick sectors around the world, we find that governments oftentimes know very little about emissions from the traditional brick production sector. We know that brick kilns contaminate (and lots) because of the black smoke we see fuming from the haphazardly constructed kilns (sometimes called Clamp Kilns), but little data and technical capacity exists to actually *measure* contamination. This is partially the case because many kilns are temporary and have no chimney or contained way of precisely measuring the specific emissions from the kiln without capturing other

contaminants that may already be in the air (including from other kilns but also from other industries or household burning). This makes measuring emissions from the most traditional kilns, nearly impossible.



- (1) Clay is extracted from land by hand or with mechanical machinery
- (2) Clay is mixed with water and other additives (sand, biomass, ashes, etc.)
- (3) Worker places clay into wooden or steel molds by hand and lays bricks behind on ground for drying
- (4) Bricks are left in the sun to harden for several days
- (5) Raw dried bricks are piled into a cubical or cylindrical structure leaving air tunnels below for burning fuel (this is the brick kiln, or oven; clamp design)
- (6) Workers obtain wood, waste or other fuel and ignite the brick kiln oven (scove design with protective insulated cover of mud/bricks)
- (7) Brick Kiln burns black and white smoke, emitting toxic fumes, black carbon etc.
- (8) Smoke contaminates local community and people nearby

Also, in many cases, the government agencies (perhaps like your own) that are suddenly concerned with emissions from brick production are not necessarily the ones that have traditionally engaged the sector. You have probably been called to address emissions from bricks because someone (maybe your own agency) has noted the smoke from the kilns and realizes that something needs to be done with this little-understood but very problematic source of contamination. This new-found interest in addressing traditional brick kiln contamination, and the lack of a historical past in dealing with it, makes addressing the sector in the 21st Century, an even greater challenge.

This general lack of knowledge is not surprising, but rather reflects the fact that concern from brick production emissions is mainly coming from government agencies that have only recently become engaged on tackling climate change (as for example, through new air quality standards coming from environmental ministries), while the agencies that may have addressed brick production or through which brick producers

might be organized or have frequent contact in the past are likely to be related to mining or production, or even to small and medium enterprises.

Furthermore, traditional brick production is oftentimes a very *seasonal* and *marginal* activity, loosely or only tenuously linked to geographical locations, and often on the fringes of legal formality, or entirely in the informal sector, making government oversight of the sector very difficult at best. As societies have modernized, and as their appetite for cleaner environments have grown (alongside their *intolerance* for very polluted ones), traditional brick producers have been literally “pushed” away from populated residential centers and into less regulated, sometimes completely lawless urban fringes. The “lawlessness” of the sector is particularly problematic for the task of development a traditional brick sector strategy, since the absence of regular governmental control, engagement through permitting, regulations, contamination measurements, etc., also results in the absence of sector data, of systematic “sector” controls, and of public sector outreach to the production unit. If no government officials of any type are systematically visiting brick producers, your agency may be the first public agency to establish that link. That is both an enormous challenge but also a great opportunity to harness critical baseline information about the sector.

This summed to the fact that the most traditional brick kilns (which are also the most contaminating ones) are built and then disassembled after the baking of the bricks, completely disappearing once the burning is complete, makes collecting regular and verifiable data about the sector extremely difficult. You may see the billowing smoke of kilns in the dry season, and then go out to survey the kilns in the wet season and find that they have entirely disappeared!

As you read some of these descriptions of the sector, as a public servant knowing your own agency’s areas of engagement, you are likely already coming up with ideas of what your agency might be able to do about much of this informality and lack of data. The probable “uniqueness” of the opportunity to engage the sector for the first time ever, should help drive you to carry out a strategic assessment of the sector that will lay the ground work in your country for generations to come about how to engage the traditional brick sector.

Societies that still manifest significant existence of traditional brick kilns, which display high levels of contamination, also commonly suffer from fairly systematic problems related to the sector. Some of these might include (see [PAN LAC Regional Strategy Document](#) for more details):

- Significant levels of informality, permitting the establishment of traditional brick kilns in marginal or uncontrolled urban/rural areas near market outlets
- Lack of land titles or lack of formal arrangements for use of land by producers
- Lack of air quality laws/standards/regulations
- Lack of capacity of monitoring air quality standards (where they may exist or be introduced)
- Technical complications of measuring air emissions from industry
- Poor labor practices including often, child labor or senior citizen labor in brick production
- Animal abuse in the hard labor and transport of bricks
- Poor health conditions for workers and community living near brick kilns
- Lack of general knowledge of the sector (how many kilns, what type, producers, where, etc.)
- Lack of local academia attention to the sector
- Ineffective or non-enforced land-use regulations
- Weak or no product quality standards (bricks may vary greatly in quality)
- Little understanding of the business model and “economics” of the sector
- Difficulty of small producers to market their product effectively
- Lack of knowledge or incentives for ways producers can improve product quality
- Lack of knowledge or incentives for ways producers can improve burning efficiency
- Lack of comparative knowledge of how bricks are made outside of the local environment

- High levels of “manual” processes of production (mixing, molding, baking, transport, etc.)
- Lack of producer knowledge of existing machinery available to improve efficiency and reduce labor
- Fear/resistance to change / reliance on traditional customs for production
- Dominance of market by larger producers or buyers (large commercial warehouses)
- Lack of access to credit for capital investments in the sector

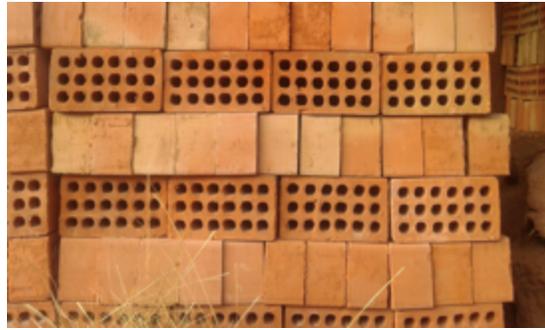
In countries where traditional brick production still makes up for a significant percentage of brick production, it is likely that traditional brick producers have had to struggle with recently evolving zoning and land-use issues and pressure. Maybe they have been pushed to the fringes of ever-expanding urban neighborhoods, or have become trapped inside of residential communities that have grown around them, and now face strong intolerance of the poor air quality caused by brick production. This has generally generated political pressure for public officials to exile brick production to public lands outside city limits, or far enough away so as not to bother local residents. Public responses to this dynamic have often been temporary, temporarily offering producers non-utilized public lands for brick production. Eventually, urban sprawl reaches these lands, and the outward push cycle begins again.

As a result of these common dynamics, as a public official, you have to engage a sector that is a moving target not only because of the curious nature of its production process, but because it is physically moving from place to place. It is likely that brick producers have learned to adapt to evolving pressures to move, further and further away from areas that are regulated and controlled by public agencies and that have been able to skirt growing environmental regulations on air quality and climate change causing emissions (GHGs). If you are to succeed in bringing traditional brick production under an organized, regulated and efficient formal sector framework you may be undertaking a complex multi-jurisdictional and multi-sector planning process involving many more actors than merely those in your own agency.

This reality presents a challenge not only in terms of understanding, inventorying, quantifying and measuring the extent of the problem you are facing with brick kiln emissions, but also in terms of determining if the problem of traditional brick production lies entirely within your government agency’s jurisdiction to deal with the sector, or if you will have to seek collaborative assistance from other government agencies (another ministry or department) or maybe also other jurisdictions (cities, counties, provinces, federal).

Another common gap in traditional brick sector knowledge is information about the business itself. Traditional bricks are thick, heavy and made with mud, often by hand. Today, modern, lighter, hollow and more uniform *and generally less-contaminating* bricks have in many cases replaced traditional ones. (see image below) Nonetheless artisanal producers continue to fabricate traditional bricks. What are the underlying reasons for this? Is it cultural? Is it market-driven? Does the market place a greater or lesser value on traditional bricks? Are traditional bricks perceived to be of “higher” quality or of lower quality? Do traditional brick producers want to modernize or are they unaware of the evolving field? Is traditional brick production making a reasonable profit? Could it make a greater profit with investments, be they small, medium or large? Are there investment opportunities in the local market to introduce newer and cleaner technologies? Can producers get access to credit if they want to make such investments?

These are all questions that governments that want to reduce brick kiln contamination should be asking themselves and to do this, government agencies should be gathering sector information about their traditional brick production in order to better understand and develop policies to engage and guide the sector.



Compare quality of bricks molded by hand with bricks extruder from industrial press



Mid-level Extruding Equipment and Brick Molds for Extruders require several US\$1,000s

Hand molding is strenuous work

What to do:

Carry out an Inventory of the Brick Sector

If you are facing some of the same systematic challenges that many of your colleagues attempting to address traditional brick production face, in which little government-owned knowledge of the sector exists, it's probably clear by now that if you don't already have an official sector inventory and description, that you need one. A comprehensive Traditional Brick Sector Inventory and characterization is fundamental to characterize the brick sector in your country or jurisdiction and to be able to devise efficient and effective policies to address emissions reductions and other social and environmental improvements to the sector. If your public sector has carried out past work on such an inventory and description, you may have an important portion of the work completed, but if you're like most, past work will be incomplete, missing key data about emissions and other contamination, or about producers or about the economics of brick making. Alternatively and in many cases, any characterization may be lacking altogether.

As you sit to consider how to devise a useful traditional brick sector inventory, some of the questions you'll need to answer in such an inventory (all of this information will be essential to know sooner or later in the process) include:

- Where are bricks produced (cities, regions, states, etc.)?
- Has brick production moved? When and why? Following what +/- incentives?
- What types of bricks are produced? Solid, hollow, size, color, or other design factors?
- How many bricks are produced by region/locality? And by how many producers?
- What machinery (if any) is used in brick production? Mixers, extruders (presses), etc.
- What type of power is used in fabricating bricks, human, animal, mechanic?
- What are the labor conditions of these workers?
- How are animals treated in brick production?
- What type of kilns are used to produce bricks (design, temporary, permanent, chimney, etc.)
- How many bricks are produced per kiln?
- What is the loss/discard rate per batch unit? (how many bricks are lost per thousand bricks)?
- What type of raw materials are used for the clay utilized and what other inputs are used?
- Where is the clay for bricks extracted, under what land-use regulations and what are impacts?
- Is the land use (clay extraction) sustainable? And if not, where will brick producers obtain clay?
- What type of fuel is used to burn the bricks (wood/sawdust, garbage, petrol, gas, etc.)
- Have brick producers received technical training?
- Are producers utilizing new technologies? Eg. blowers? Mixers? Extruders?
- What is known (if anything) about the emissions from these kilns? Do they evidence black smoke?
- What are the norms regulating (if any) brick quality, for market, for building safety, etc.?
- How efficient is the production?
- Is there a market analysis of the sector?
- Who produces the bricks? (small, medium, large producers?, family unites, cooperatives, etc.)
- Are there human rights issues evident in the sector (child labor, elderly, excessive hours, etc.)?
- What types of accidents occur in the sector? Labor, environmental, health, etc.?
- What is the health profile of nearby communities? Do they suffer respiratory diseases?
- During what months are bricks produced? And what is the land used for during the off-season?
- Are brick workers migrants? Where are they from? Do they hold other jobs in the off-season?
- Who buys the bricks? Are there intermediaries? Large buyers?
- Are there brick producer associations and what are the characteristics of the membership?
- What is the market share and destination for traditional bricks vs. scale production hollow bricks?
- How are bricks distributed? Animal? Trucks? Etc.
- Do brick makers have access to financial resources (investment loans, etc.)
- Are brick makers aware of technological opportunities for more efficient brick production?

These are some of the more standard questions that you might ask yourself in a brick sector inventory. You probably will want to hire a technical expert that is knowledgeable about brick production to assist you analyze the sector. You may assign some of your local staff to carry out part or all of the inventory, or possibly contract a local university department to carry out a sector study. Keep in mind that the questions are very different in nature, and may need to engage different types of specialists, including technical brick production specialists, economic experts, environmental experts, labor specialists or social impact experts, etc.

The CCAC and the PAN LAC specifically has tools to help you and can also provide you with sample inventories that have been carried out by public officials in the past! Some of these include:

Training Nodes / Training Manuals, already being piloted in Colombia, Mexico, Peru, Chile and Brazil to develop a common understanding and comprehensive guidance on technologies that reduce SLCP emissions from brick kiln production. More information on Training Nodes at: <http://www.unep.org/ccac/Initiatives/ImprovedBrickProduction/TechnologyTrainingNodesandTrainingManuals/tabid/794082/Default.aspx>

A Study of the Business Case for Brick Production, involving the development of the business for the complete chain of artisanal brick production – from gathering raw materials, labor organization, production processes, and distribution channels, to the final sale. More information on the Business Case, see: the [Climate and Clean Air Coalition \(CCAC\)](#)

A Market-Based Pilot Project, aiming to implement an integral kit of policies, including command and control measures (relocation, emission standards, construction regulations, etc.) as well as economic instruments (social aid programs, credit, subsidies, technology transfers, fiscal exemptions, emission market schemes) and market instruments (labeling, certification, public information, public purchases). Pilot efforts would include working with city or local governments and private or industry sector entities to promote a cleaner production and possibly the certification of bricks. More information on the Market-Based Pilot Project, see: the [Climate and Clean Air Coalition \(CCAC\)](#)

A Climate Accounting / Measurement Tool, being developed in Colombia to help characterize the brick-making sector at the country level, allowing policy makers to make first order assessments of problems related to brick production. More information on the Climate Accounting Measurement Tool, see: the [Climate and Clean Air Coalition \(CCAC\)](#)



Clay mixing pond adjacent to Traditional Brick Manufacturing site. Cauquenes, Chile



Three traditional brick ovens in Cauquenes Chile. The kiln in the back left has been sealed and is ready for firing.

Step 2: Understand Your Jurisdiction

While the content of these Guidelines clearly show that many governmental agencies are likely to have a vested interest in the social, economic and environmental dynamics of traditional brick production, the chances are high that if you are reading this *Guideline* you are a public official from an *environmental agency* either focused on addressing climate change or more specifically air quality.

That's not because environmental agencies care more about bricks than others, but simply because the type of contamination commonly associated with traditional brick production is black carbon (soot from bellowing black smoke coming from traditional brick kilns) and this type of contamination has become a national and local priority for many governments in the last few years, and has hence, attention to traditional brick contamination has probably come under the radar screen of environmental agencies for this reason.

You've probably come to this issue because in your quest to reduce air contamination you've identified that traditional brick kilns are a key source of contamination and maybe, no one else in your government is trying to do anything about smoke from brick kilns. It's also probably the case that your agency (maybe an Environment Ministry) has never engaged brick producers. This is likely because in the past, the brick production sector in many countries was folded into "mining" activities, and there usually is a "mining" ministry or other government agency that may regulate land use permits for brick production. Or, it is possible that because of the marginal informality of kiln locations, at the fringes of urban areas, brick producers engage more directly with *local* government officials issuing land-use permits and not with federal ministries that have no traditional jurisdiction with peri-urban environments or with the sector specifically. It may be that *no* government agency at *any* level has ever specifically targeted the traditional brick production sector. Again, you are not alone with these challenges!

Whatever the reason you are engaged in this discussion, it quickly becomes clear as we begin to delve into the challenges of addressing traditional brick production in the 21st Century from a public policy perspective

and action plan, that much more than the “Environment Ministry” will probably have to engage the sector if we are to help guide traditional brick producers into a more sustainable format.

What to do?

Carry out a Jurisdictional Mapping Exercise Focused on Bricks and Engage your Peers

For starters, if you are a federal agency, once you’ve carried out some basic reconnaissance of the sector (Step 1) you’ll probably want to map out jurisdictional responsibilities (associated to each of the witnessed challenges) so that each agency of the State at the various levels can engage and help address the sector and develop appropriate solutions for it according to its own priorities and engagement areas. If you are a local government (a city or region), you’ll probably have to reach upwards to promote the engagement of the federal government to determine just who to call and bring aboard for each of the challenges you want and need to address. In most cases, a comprehensive approach to the problem, tackling all angles or as many angles as is realistically possible, will be necessary for assuring a long term and sustainable solution to reducing emissions from traditional brick production and for making the sector more socially and environmentally sustainable. You can choose to tackle only the issues that are within your agency’s interest and jurisdiction, but a more comprehensive approach, if possible, is always advisable.

Consider the following possible jurisdictional actors to bring to the table (the list is not exclusive):

- Environment Ministry for air quality issues and other contamination-related dynamics;
- Mining Ministry (if applicable) for permits, excavation, earth removal activity;
- Production Ministry (if applicable) for business related relevance-particularly SME promotion;
- Labor Ministry for working conditions, child labor, health and safety of workplace;
- Health Ministry to address community air quality and worker related diseases/illnesses;
- Finance Ministry for banking/financial sector access for producers;
- Regional government agencies for region-wide character and dynamics of the sector;
- City government officials for local permitting, zoning, land use, etc.
- Development agencies (regional or federal) for investment opportunities;

As you develop the subsequent steps to your intervention (Steps 3-10) it would be a good idea to develop a contact list for public officials in each of the relevant jurisdictions you’ve identified in this step, and ensure regular communication about your efforts to your peers, and consider the importance of their presence at the various workshops, debates, brainstorming sessions, planning meetings, etc. that you will organize.

Step 3: Identify *and Consult* Your Stakeholders

Stakeholder Analysis

Stakeholder identification is an essential step in any strategic development plan. Particularly considering the largely “informal” nature of many traditional brick sectors, an early and *broad* (as opposed to narrow) consultation will assist in identifying and flushing out as many issues, viewpoints and dynamics as possible, allowing for a comprehensive understanding of the challenges ahead. Furthermore, even if you eventually cannot engage on all issue fronts, a comprehensive analysis with as many stakeholders as possible (Step 1) can provide key data and analytical resources for other government agencies and other actors to be able

to engage the sector in the future. Given the likely limited data of the sector, your agency's work can be important not only to *your* agency but for many others as well that wish to engage the traditional brick sector to address its social and environmental impacts and promote the sector's sustainability.

The most obvious stakeholder that you will engage in this process is *the brick producer*. But there are many other stakeholders that together comprise the sector and their collective participation and engagement is essential if the objective is to produce a sustainable long-term model for cleaner brick production.

Some of these stakeholders include:

- Brick producers
- Brick workers (permanent, seasonal, or temporary)
- Family members (women, children, elderly)
- Producer intermediaries (collecting bricks from small producers and selling to wholesalers)
- Large buyers (chain stores, industry giants)
- Financial sector actors (banking, development agencies, etc.)
- International development agency representatives (IADB, World Bank, etc.)
- Other public officials from other government agencies
- Community members (suffering contamination)
- Environmental groups
- Human rights or other socially oriented non-profit organizations
- Animal welfare groups
- Local hospital or neighborhood clinic staff (doctors, nurses, etc.)
- Small Business Enterprises Associations
- Labor Associations
- The academic sector (universities, etc.)
- Regulators
- Mayors and other local officials
- Tax authorities
- Brick production experts (consultants)
- Architecture/building associations
- Standardization/Verification agencies (such as Bureau Veritas)
- Industrial Equipment producers of (mixers, extruders—a *brick press machine*, etc.)
- Competitors (other brick producers, modern brick, larger producers, etc.)
- Other public officials/policy makers from the brick sector from other jurisdictions, countries, regions, etc.
- Members of the media, local, regional, national

Visit the Kilns

It will likely be the case for public officials engaged on addressing air quality, that through this stock-taking and inventory exercise they will be engaging the traditional brick sector for the first time. A site-visit is fundamental to gain a proper, initial and general understanding of the sector. Unlike mere academic documentation review, a site visit will reveal a wealth of information to the public official that will better prepare the agency to gain the knowledge it needs to undertake a development strategy for the sector.



Traditional brick producers in Chile usher city, regional, national and international actors through his brick production facility.



Simply visiting a kiln in production, talking to a producer about the challenges they face, watching workers go through the production processes, exchanging information with a local authority that manages permitting or environmental controls, visiting a local health clinic to gather information about respiratory and other local illnesses near kilns, engaging with local schools who may have students working at kilns, talking to local banks, meeting with local architecture associations, or meeting with community members that face contamination from producing kilns, provide policy makers with invaluable background and contextual information that will more effectively inform strategy development as well as the design of all programs and actions to be taken.

The process of initial stakeholder identification coordinated with a site visit will also help the policy maker identify and consider the necessary actors to bring to the table for an eventual space (a policy workshop) in which to exchange information and explore public options for the sector (Step 5).

Stakeholder Engagement

Especially noteworthy for consideration on engaging stakeholders is “when” to engage “which” stakeholders. When designing your workshops and brainstorming sessions (Step 5), to gather information for input into a development strategy for the sector, it is important not to confuse:

- 1) opportunities to discuss technological innovation in production, from
- 2) opportunities to discuss policy choices for the sector

Planning for this distinction and ensuring that both are achieved is crucial to get your public strategy and plan moving efficiently and effectively. It is important at some point in the process to bring brick producers together to discuss the challenges of brick production and the technological and mechanical opportunities

for improving production processes to make them more efficient. In such a setting you probably want to have a room full of brick producers with a few experts and policy makers present and expose them to information and presentations focused on technology and innovation options. It is quite different however, to convene a meeting to discuss public policy, where you will likely want to have a majority of *public officials* engaging in discussions, with (maybe) a handful of producers to inform the debate, plus a handful of experts to educate and guide the debate, and possibly other actors brought from other countries or jurisdictions that have already gone through the formulation and implementation of policy in the brick sector (or public officials that like you are *considering* going through the steps) of developing a traditional brick sector strategy.

Partners working with the [CCAC's Bricks Initiative](#) regularly hold workshops bringing together traditional brick producers from many countries, and have a wealth of knowledge on what topics these training sessions can cover and how to hold such events, how to design training and pass on technical knowledge gained to the more experienced or to the most rudimentary level brick producers. The CCAC's "[Technology Training Nodes](#)" offer such training assistance and guidance to governments. Workshops can focus on improving clay mixing, brick drying techniques, fuel efficiency, oven design, utilizing mechanical production machinery (extruders, mixers, automated channeling of bricks through ovens), capturing and reusing excess heat, better marketing bricks, etc. All of these types of training are important and can in many cases help make brick production more efficient and less contaminating. It is likely that at least some portion of your Brick Sector Strategy will involve these types of innovations and require specific capacity building for brick producers.



Left: Brick producers technical workshop organized by CCAC partner Swiss Contact; Right: Session of public officials to discuss policy

However, what we are discussing in these Guidelines *is not* so much a focus on technical training for producers (which might be “a component” of your eventual Traditional Brick Sector Strategy), but rather workshops offering opportunities for policy exchanges, debates and brainstorming for public officials.

In this other model (prioritizing public officials) the focus of attention is on the public policy makers, and the choices and opportunities they have before them, to induce change. The nature of the discussion is “political”, honing in on the available leverage and jurisdiction of public officials to induce change. As such these sessions may sometimes have to be in closed-door environments, permitting a more candid exchange of the social, economic and political implications of public policy choices, discussing the liberties and barriers that public officials may have to introduce public policy in their areas of jurisdiction. These sessions will hopefully allow for very candid and practical discussions, which public officials can utilize to take decisions on how to move forward, analyzing risks, opportunities and fertile terrain for policy advancement.

Both workshop models are important and appropriate to consider at diverse times, but it is clear that fostering a significant discussion on *public policy choices*, will be key for the design and implementation of an effective brick sector strategy.

Step 4: Define Your Objectives for Developing a Strategy

Having followed the logical sequence of Steps 1-3, you've now learned a bit about your brick sector, you know where the brick producers are and who produces the bricks (Step 1). You've mapped out who has jurisdictional capacity to engage the sector (Step 2). You've identified stakeholders and engaged some of them for preliminary discussions on thoughts to develop your traditional brick sector strategy (Step 3).

Now it's time to determine what direction you want to give to the development of your brick sector strategy. At this point, it's probably not a good idea to set your objectives in stone, but rather, it is important to define a general direction to orient your preparatory work which will help you better define the ultimate direction and objectives you will set for your strategy. Since this is likely to be a new sector of engagement for the State, it's a good idea to set out with an open mind and allow for flexibility to steer the strategy towards areas where you can take advantage and leverage the intervention of the State as best as possible.

Some of the objectives you may set out to tackle may have already been set for you, for example, by an Environmental Minister who has already identified black carbon emissions from brick kilns as a "must engage" issue. It is maybe even likely that you've come to the brick sector precisely with this objective in mind. Once you've started engaging, a fine-tuning of this objective might be simply to measure emissions, or perhaps you have already decided that you must reduce high levels of brick kiln emissions to a certain level in the medium term—or that you are aiming to close down or perhaps convert high level polluters. Or you may have some flexibility to design your own multi-sector and comprehensive approach strategy to cleaning up the air, and brick kilns may be only *one* option amongst others, and you are debating on whether or not to engage, devote your time to, and assign public funds and staff to the task.

Setting realistic objectives at this stage that are within your reach, within your jurisdictional mandate, and within your financial capacity, and perhaps most importantly, within your political will to achieve is fundamental to ensuring a smooth and successful evolution of your traditional brick sector strategy. Reducing black carbon emissions from brick production has a rapid and immediately tangible effect on air quality and if you can place a program in motion quickly to address the most apparent sources of contamination, it can have remarkable results. You will however have to think very strategically about how to use limited financial resources to get the most efficient and effective results from the human and financial resources you commit.

If you are an Environment Ministry focused on air quality emissions, your most likely objective will probably be all realistically viable actions aimed at "reducing emissions" as quickly and as effectively as possible. But even such a simple objective may not be so simple to carry out for the sector.

One key question many environmental agency officials end up asking themselves as they begin to understand how traditional bricks are produced is, "can I even measure emissions in the brick sector?" Even a simply question like that one, may not have clear linear answers when you consider your agency's capacity to resolve the challenge. It may be for example, that you simply may *not* have the technical equipment necessary to carry out sector wide measurements of brick kiln emissions. It may also be that although you may have the equipment to measure emissions from many industries, the existing kilns designs do not adequately adapt to your measurement equipment (they may not have chimneys for instance, needed for proper emissions quantification).

This section is not so much about the brick sector strategy itself, but rather how you are going to go about developing it. How will you pick apart the issues that characterize the sector? Are you going at it alone and within your limits, or are you moving beyond your jurisdictional boundaries and seeking collaboration from other ministries. Going at it alone will surely not produce an integral approach to resolving the challenges of the sector. It may address one aspect of the sector, for instance, quantifying emissions. You may be able to

acquire equipment and get brick producers to install a chimney in their kilns so that you can measure the emissions. You may be able to add another dimension to your objectives by also working to reduce those emissions once you get them quantified, for example, by getting producers to modify their fuel intake and combustion and improve their burning efficiency. This “reduced” set of objectives targeting one dimension (emissions), while having its own challenges, might be a manageable set of objectives with related actions and targets which could be managed entirely within your jurisdiction and agency’s action scope. In the case of Colombia, for example, the government was able to pass strict emissions standards for the brick sector, as well as mandating the installation of chimneys in kilns, to permit proper monitoring of emissions. (More on various policy directions from the Latin American region can be found in [PAN LAC’s Compilation of Policy Frameworks](#).)

And while properly identifying such objectives will help you move towards compliance with your quantitative measurement responsibilities, by themselves, they will likely not solve the problem of unsustainable brick manufacturing. You may instead be more ambitious and aim at bringing in several ministries to tackle the entire sector (addressing issues such as labor conditions, health, informality, and the economics of brick production), effectively bringing the traditional brick sector as a whole out of the past and into a future of sustainable production. That objective, however, will require a much broader set of dynamics, collaboration, and shared responsibilities.

Identify and define your objectives clearly and realistically!

Draw from your consultation

Your stakeholder engagement (Step 3) should have given you a general knowledge of the opportunities and challenges existing in the brick sector for efficiency innovation and to reduce social and environmental impacts. It has also put you in contact with peers that are possibly working in or interested in working in the sector, and you’ve seen or sensed opportunities for collaboration with other agencies or jurisdictions that you did not anticipate before setting out on this exercise. Harnessing that collaboration will be key to your success in building as broad and integral a process as possible to engage and transform the sector.

It’s now a good time to bring some brick production specialists to the table that can help you hone in on specific technical challenges and opportunities that may exist in your country to move the sector towards sustainability.

You’ve probably identified some of the bottlenecks (antiquated production processes, no available technology—or knowledge of that technology, no financing, no investment, or no incentives to bring change to the sector, perhaps you’ve identified a lack of emissions regulations or legal stipulations on kiln design), and you’ve mapped out the actors and agencies necessary to address each. Now it’s time to fine-tune, and identify *where* and *how* your leverage (and that of your collaborators) can help bring about sector innovation and transformation. Your initial research on needs, gaps, priorities and other key considerations that derive from your stock-taking, inventory, market analysis and multi-stakeholder consultation, as well as your mapping of jurisdictional responsibilities will assist you in developing the next step towards sector transformation. Sector specialists, whether they are technical experts in brick production or public servants such as yourself that have already gone through these motions, can assist you to identify low-hanging fruit, vs. more in-depth investments that can help transform brick production towards cleaner, more efficient and sustainable models.

As this information appears, and these opportunities begin to surface, the solutions may or may not lie entirely within the limits of your agency’s jurisdiction. They may need to be carried out in collaboration with other government ministries or levels of jurisdiction (federal, regional, municipal, etc.). The degree of

independence and budgetary dependence between actors will determine your agency's discretion and control over the strategy, or the degree to which it becomes a multi-actor dependent strategy in which your agency will have to cede and share responsibilities and control with other actors.

As you define your engagement and brainstorming (Step 5) you should be focused enough to help guide discussions in an orderly and targeted manner (for example, by setting the expectation of coming out of your consultation/brainstorming with the 3 or 4 priority strategic areas of intervention and some of the likely actions that you might take), but flexible enough to adapt and adopt your strategy along the way to the information and debate that comes from the rich multi-stakeholder consultation you are planning.

One way to do this (see PAN LAC's [Capacity Building Course Design](#) for more information) is to build into the brainstorming session (more in Step 5) a specific session on defining priority areas of intervention, or directly having a session focused on future strategic planning.

By the end of Step 4 you should have a sense of the likely boundaries of your strategy, whether you are going to take an integral approach to the strategy, working in the agendas and interests of ministry and sector actors, or whether you plan to keep your actions solely within your agency's jurisdiction. You should start Step 5 (the brainstorming process) with as flexible a position as possible, and to the extent you are planning an open, integrated and multi-actor approach, you should be approaching the sector with as much flexibility as possible in order to capture the richness of the engagement and identify as many opportunities for engagement on different dimensions of the problem as possible (technology, labor, economics, environment, etc.).

Step 5: Brainstorm

Hold a Policy Workshop to Brainstorm on Public Policy Opportunities and Challenges

Policy makers able to introduce or implement brick sector policies will be eager to debate the various forms they can contribute to modernizing the sector and reducing emission from brick production. The PAN LAC was created precisely because the public officials attending technical workshops focused on and targeting brick producers and available technical innovations, were hungry for an opportunity to exchange ideas and debate on just how to utilize public policy to guide producers to make changes and innovate.

It's important to hold *and focus* workshops for policy makers, specifically on the "policy" aspects more so than on the technical issues therein contained.

The PAN LAC has already carried out several such "policy" focused brick sector workshops for the benefit of public officials, and has concluded that these "policy" oriented sessions are extremely conducive to discovering policy options and inspiring public officials and government agencies to take action in the sector. Workshops have been held in [Mexico](#), [Peru](#), and [Chile](#) (see these links for summary conclusions of these workshops). These workshops were specifically designed to bring together policy makers and other stakeholders from national, provincial and local levels, interested in advancing ideas towards devising public policy related to the traditional brick sector. (The program agenda of the workshop in Chile, which was the PAN LAC's official inaugural workshop can be downloaded [here](#)).

More specifically, the PAN LAC has also developed a "[Capacity Building Course Terms of Reference](#)", which outlines a generic approach to convening a public sector discussion workshop space bringing together brick sector experts, policy experts, producers, and other stakeholders for a useful debate geared to assist government officials to develop a sector strategy.

One of the most important and distinguished characteristics of the methodology of the course is not only to bring sector specialists to the table (that is, people specialized in brick production or public officials that must engage the sector), but also *other* public officials (perhaps from other countries or regions) that have addressed the same challenges and have devised successful ways to address the sector, tackle contamination and place policies and programs into practice. Even public officials that are interested in, but have not yet engaged the sector, can provide very useful thoughts and insight to the discussion whose potential contribution should not be underestimated.

The [Capacity Building Course Terms of Reference](#) prepared by PAN LAC is devised to assist government officials to define objectives, identify participants and trainers, determine subjects to cover for capacity building, engaging high level political figures, and how best to use the course to plan out policy changes as well as how to utilize site visits and other inter-jurisdictional dynamics. And finally, and most importantly, these terms of reference assist government officials on how to utilize these stakeholder engagement opportunities to develop effective strategic strategies to reduce emissions and improve efficiency of the traditional brick production sector.

Brainstorming on brick sector strategies needs to strike a balance between analysis of the sector at technical, economic, social and environmental levels, with discussion on legal and policy reform opportunities and leverage points (environmental, financial, land-use planning and permitting, laws, regulations, etc.), and enable those present to explore policy options that are on the table taken from real cases across the globe where traditional brick kiln public policy has been devised and implemented to address the sector.

Cater to the Public Official

One of the reasons the PAN LAC and its sister network the PAN ASIA were created, was because the traditional approach to address the sector, focused almost exclusively on the “technical” issues involved in brick production. For example, how do we make a kiln contaminate less? Or how do we reduce waste bricks, or how do we make the burning process more efficient? This sort of “technical” workshop focused on technical issues are extremely important for brick producers, and can even help policy makers understand the challenges and opportunities available in the industry, but in many ways, such workshops alone did not necessarily offer clear recommendations for the public sector to help induce that transformation. Side-events began to take place at these technical workshops where public officials would come together after the event, to discuss how they could encourage, guide and create the policy incentives to put the transformation processes into effect. That is how PAN LAC and PAN ASIA came to be.

Stemming from and driven by this outgrowth of policy needs and demands, the CCAC created the world's *only* international discussion platform for public officials to discuss how to devise public policies to address emissions reductions from brick production. It is a model that is serving as a test case for other public policy oriented discussions for other sectors.

“Brainstorming” with public officials on traditional brick production policies *must* include public officials, and lots of them, in fact a majority of those present would ideally be public officials in a position to help induce change through policy actions, if it is to have the flavor, tone and dynamic of a policy debate that is conducive to public policy creation. It must be informed by, *but not dominated by*, producer presence. The brainstorming sessions should additionally include more public officials than merely those working on the development of the strategy, since exchanges with other policy experts, government officials and representatives of other complimentary government agencies (finance, health, labor, etc.) will provide the rich and broad comprehension of the policy opportunities and programs that may be available to advance towards the objectives of an eventual traditional brick sector strategy.

Further, brick production experts that are knowledgeable of the state of the art of the sector (especially of its sustainability) should also be present to advise on the opportunities they see according to the types of technologies currently in use in the country for which the strategy is being developed. It is best when these experts have experience accumulated from a diverse set of countries, to be able to compare and contrast local production to experiences across the region helping identify where the shortfalls, gaps and opportunities lie. Oftentimes, a single experience, or part of that experience, may or may not be adaptable to a new context, and for this reason, expert consultants with a diverse background with knowledge of various alternatives is a useful perspective to have for a policy maker at such an event.

The brainstorming is also enormously benefited by actual hands-on knowledge and access to actual kiln operations. As such a site-visit during the workshop, attended by policy makers but guided by production experts and hosted by producers who can each share their visions, frustrations, their existing engagement with the state, their expectations, needs, etc. and who can also exchange onsite ideas on technological opportunities that may exist as low-lying fruit (or even with some investment) can go a long way to help policy makers identify opportunities and map out possible and realistic action scenarios into the future. It is also an opportunity for public policy staff of government agencies to engage directly with the beneficiaries of their eventual new or revised policies for the sector. It also serves as a sounding board for policy makers for the strategic intervention ideas that they are surely already entertaining throughout these experiences and workshops and through the previous Steps they've already advanced on.

Gear Discussions to Public Policy Solutions

It is easy for these workshops to get caught up in the evolving technological developments of brick production. It is paramount however, that in supplement to visits to brick kilns, and workshop panel focuses on technology, or on kiln design options, or on other discussions about recent evolutions of the sector that policy makers have the targeted and specific opportunities they need to bring the discussion around to public policy. Consider that for each unit of technical discussion at least an equal portion of time (if not more) is devoted to policy discussions. So if one half day was devoted to reviewing options of technological innovation, at least that much or more should be devoted to discussions around policy or breakout groups to come up with proposals for policy reforms.

Depending on the dynamics and openness of the host government, and its willing to share its unripe exploratory ideas about where the sector is going, it's probably a good idea to keep the producers (the brick makers) and the technical experts engaged even in the discussions that are strictly policy-oriented.

A discussion about policy alternatives with producers and experts present, allows for reactions of producers (the end targets of policy) and frank discussions about how the sector might react, what are the best incentives to induce change and to help identify what some of the bottlenecks and perhaps insurmountable hurdles may lie when one considers the realistic ability of the sector to comply with new policies. It's also a good clearing house moment to identify and eliminate proposals that are unlikely to work for reasons that become clear with brainstorming engagement with producers.

Each session of policy discussions should end with policy recommendations, or at the least with someone of the host agency taking notes of the key issues raised and recommendations received. The conclusions of previous PAN LAC workshops available at the following links are samples of what the conclusions of such workshops may look like. ([Mexico](#), [Peru](#), and [Chile](#))

These policy sessions should provide fertile fodder to develop specific policy identification and recommendations. For more information see: [Capacity Building Course Terms of Reference](#)

Step 6: Identify Opportunities, Challenges and Tiered Solutions

By the end of your brainstorming sessions (Step 5), and the several participatory sessions you've held with experts, public officials, producers and other interested stakeholders, you should have a list of identified policy and other intervention priorities, several of which should be within your reach to adopt and implement. Some of these interventions may require collaboration with other ministries or actors, and you may depend on that collaboration in order to advance (at least for a more integrated and multi-sector approach). You should also have a more comprehensive knowledge of your traditional brick sector understanding where you might be able to leverage change. You should have gained insight on how your brick sector compares to other traditional brick sectors in other countries and where are the advantages and shortfalls of your sector lie. You should also have a sense of where the key short, medium and long opportunities lie, as well as a sense of the realistic costs of implementing the ideas that you are considering. You should be able to identify some low-hanging fruit options that might be implemented right away with minimal financial, legal, regulatory, or structural pre-conditions, as well as more complex, capital or financially costly investments that will require more complex policy solutions and/or greater budgetary capacity, legislative/regulatory and political commitment. In the best of cases, you may also have a high level public official, such as a Minister, or Agency Head, willing to commit political and financial support to address the sector.

Some common findings after your consultative and brainstorming sessions may be (each case will be different; these are simply cited as examples):

- More data is needed on sector characterization;
- More data is needed on economic analysis of the brick sector (in order to identify opportunities and bottle necks);
- More capacity is needed of environmental authorities to address emission measurement and monitoring;
- More information is needed on the “quality” of bricks, their heat efficiency and other technical aspects that could be easily and quickly modified to make the sector more efficient (remember that production efficiency can mean lower emissions!);
- More regulatory or legal norms are needed in that are geared to the sector;
- There are some low-hanging fruit technology fixes that can improve brick efficiency that can be achieved by low-cost and easily arranged capacity building for producers;
- Small investments like blowers or mixers combined with technical training can make substantive gains for small producers, increasing energy efficiency, improving brick quality, reducing fuel costs and lowering emissions;
- Some cross-agency collaboration can help address issues of informality, working conditions, etc.
- Mid-level investments in infrastructure, including extruding machines, or installing chimneys or building semi permanent kilns may need SME financing assistance which may be achieved through local partnerships;
- More serious and large investments in new and permanent oven designs may need further consideration and more significant participation of financial actors or other government programs;
- More systemic and integral approaches may need significant cross sector collaboration from other ministries (mining, production, labor, health, etc.)
- Select “other” governmental agencies may be more or less willing to engage;

- Resources from “other” sources (other ministries, or development banks/agencies) may or may not be available to tackle planning and implementation;
- Local leaders/champions for change may have been identified to pilot programs and/or serve as examples for others;
- International financing or technical assistance may be available for certain types of engagement;

Set your priorities and targets within reasonable limits and likely budgetary and political constraints

You may have great intensions and want to engage your brick sector with a comprehensive and integral approach, including introducing new regulations, measuring emissions, training producers, and making brick production more efficient, but the political and financial burdens that these ideas imply may not allow you to advance further than to achieve a few of these priority targets. You may feel that you have strong and broad support from your Minister or from a higher authority and that you can come to the table (to a higher political official) with a comprehensive and deep-reform proposal, or you may feel that you are not ready or able to embark on more than what is immediately within your agency jurisdiction or capacity.

Also, depending on the will to collaborate from other ministries, you may actually be able to go beyond the elements that your agency will manage, and rely on other agency actors to fill in gaps or work in a collaborative or staged fashion to advance towards a more integral approach to the solutions you seek.

In most cases, at least some part of the strategic action plan you follow will involve carrying out studies to examine a part or several parts (if not an entire sector study) of the brick sector, in which details on emissions quantification, production processes, economic, social and environmental implications and other dynamics are examined and vetted for efficiency and compliance. You may also choose to review the regulations and programs introduced in other countries to see if some of these might be transferable to your own country. (see [PAN LAC's Compilation of Policy Frameworks](#).)

If you are an Environmental Ministry, and your issue is solely targeting emissions, you might focus on actions and strategies that directly affect emissions, such as fuel mix and burning technique. You may want to supplement this with more efforts at establishing emissions control/measurement exercises (assuming you have or can acquire the equipment necessary to do this). In these areas, the CCAC can provide you with extensive technical resources to focus on production technique, emissions measurement and protocols, etc.

You may have to take a preliminary step and have the legislative authority (maybe a local council, a regional government or the federal legislative authority) encouraged to pass an emissions standard such as has been done in Colombia or in certain local governments of Mexico, or a brick quality standard such as exists in Bolivia and Chile, for traditional brick production which will help you provide the regulatory backdrop to your effort, encouraging or obliging the sector to quickly organize and adapt to a new regulatory environment, in which case the implementation to your program may have its necessary buy-in. This can help set the stage for a next step of sector obligation of adaptation to the new standard, where subsequent technological innovations that you help introduce could help producers meet emissions and brick quality



Retrofitting a blower to fuel intake greatly lowers fuel costs and improves burning efficiency

targets. This may also need to be accompanied by regulations establishing tax incentives for compliance, or fines or other penalties for non-compliance.

You may decide, following your interacting with other agency officials, that one dimension of the sector's problem is labor-related, and may obtain

assistance with part of your strategy from Labor Ministry officials, as was done in Argentina, engaging the brick sector in collaboration with local government, and specifically centering on the issue of child labor, or by addressing the working conditions of the elderly in brick production, for example. Perhaps your inter-agency discussions have surfaced interest from SME promoters, to engage with small sized brick producers, to help them with capacity building, or small infrastructure investments they may need to introduce innovations (an extruder, or a blower).

In sum, the opportunities and challenges you identify at this stage will depend on the extent and success of the previous engagement you've carried out (Steps 1-5). To the extent that you have been able to bring other able and interested actors to the table with jurisdiction, capacity, financing and political will to act and to commit resources to the achieve the transformation desired, you will be able (or not) to address and leverage change in each of the areas and on each of the issues you've identified as priority.

Step 7: Set Your Targets (and align them with those of partners)

Addressing the negative externalities of traditional brick kilns from a public policy standpoint, despite the complexities of the sector, is a manageable task and can have many benefits, including climate benefits as well as social and economic improvements for brick producers, workers and the communities where they are located.

These can include for example, immediate reductions of toxic emissions, including black carbon which will both help address climate change and have a very positive contribution to reducing health risks and impacts to brick workers and local communities. Introducing efficiency gains in the production process can also have an immediate and direct impact on raising income and lowering poverty, since small changes to techniques can not only lower emissions (reducing income losses due to health illness) but also improve fuel efficiency and product quality, which in turn raises product quality and lowers the number of discarded bricks that cannot be sold, lowers expenses on fuel, and provides higher income from sales. Engaging the brick sector through social assistance, aiming at eliminating informality, improving working conditions, guaranteeing health and safety of the workplace, and addressing other health related matters associated with non-sustainable brick production, can greatly improve the quality of life and guarantee the human rights of brick sector workers.

While you may have begun this exercise with the target of reducing emissions, it is important to consider the various social, environmental and economic dimensions of traditional brick production that will likely benefit from modernization investments, which in essence align with multiple stakeholder needs. You are probably setting out on this exercise seeking for a producer to reduce emissions, a worthwhile cause important to your own agenda, and while a producer may have the sufficient environmental conscience to go along with your proposal, she may actually have other priorities which take precedent, which may or may not be in conflict or in sync with your objectives. Likewise, the visible problems of the traditional brick sector, particularly one that has gone unattended by the government, are likely to be far broader and deeper than merely climate contamination. The multiple social, environmental and economic benefits of engagement with the brick sector may not initially be so apparent to those taking the first steps of engagement, however a proper study and broad stakeholder engagement process should serve to properly flush out as many issues as possible into the initial stages of engagement with the sector.

A proper economic analysis of brick production, for example, might identify for you (and for the producer) that fuel supply is a key problem and financial burden for producers. And that increasing efficiency of fuel use by introducing a new supplementary source of fuel (such as saw dust) or an inexpensive blower into the process may reduce fuel costs by as much as 30 to 40%, and have a collateral benefit of eliminating most of

the black smoke you typically see in brick kilns. Addressing the problem from an economic angle may be far more convincing for a producer, and may get you much further along the way to emissions reductions than you might have thought at the onset of your exercise. As such, carefully selecting the strategies your agency will follow, the experts it brings aboard, the research it carries out and the public policies it devises from as broad and applicable set of options as possible, as well as properly pitching change to producers and offering the most effective incentives to induce that change, will be key to leveraging your capacity as a regulator in the most efficient manner to achieve your most desired results.

Some possible targets/objectives for policy driven change that may result from your exercise:

- The development of regulatory frameworks for air quality and emissions
- Focusing on technological design innovation
- Developing best practice guidance for brick production
- Focusing on the informality of the brick sector
- Attention to land use decisions and regulations in the sector
- Developing a multi-agency approach to intervening in brick production
- Producing more information about the sector and specific/targeted sector studies
- Capacity building and Awareness Building for producers
- Attending to the social dimensions (such as poverty/labor/child labor/health, etc.)
- Focusing on improving the economics of brick production for small producers
- Regulating/monitoring/controlling air emissions

Just a few examples of simple, cost-effective and highly impacting interventions, which are generally feasible in the sort activities you might consider include:

- to design sector inventories and analysis to better grasp brick production dynamics
- to develop strategic plans to intervene in the sector
- to design basic air quality regulations and monitoring systems
- to build capacity on clay mixing
- to introduce basic mechanical improvements to burning techniques
- to introduce design changes to kilns
- to identify opportunities to reutilize excess heat from kilns for drying subsequent bricks
- to provide or facilitate small investments to upgrade infrastructure/technology

Step 8: Developing a Brick Sector Strategy

You're now ready to draft your policy strategy to shape and guide your actions and programs focused on making your traditional brick production sector cleaner and more efficient. Through the previous steps (1-7) you've probably identified a series of possible areas of intervention, and may have reviewed other country experiences in introducing policy reforms and regulations (see: [PAN LAC's Compilation of Policy Frameworks](#)), including actions such as emissions regulations, brick quality standards, developing specific policies for brick production, or promoting technical innovation programs with technical assistance provided by brick production experts, etc.. You may have also mobilized the financial sector or created public-private partnerships to agree to foster investments in modernizing brick producers. Whatever your choices, you likely have a series of actions that may be very different in nature and involve a very diverse set of actors to actually implement.

One useful approach at this stage would be to consider dividing your strategy into "types" of sub strategies on distinct issues (for example, sector studies, regulations, emissions measurements, kiln design, labor standards, investments schemes, etc.). This can help you better order your strategy, separate actions into logical, defined and distinct components, and allow you to introduce a "tiered", "sequenced" or "sector" approach that can assist you in subsequent implementation.

Some of these might include policies, actions or programs, having to do with:

- (1) Regulatory Functions: eg. Policies/Laws/Standards/Monitoring/Multi-Agency Engagement
- (2) Information development or dissemination: Stock Taking / Sector Studies / Inventories
- (3) Capacity building of producers: Clay preparation / Brick Drying / Burning
- (4) Infrastructure innovation: Press/Cutter (Extruder)/ Burning Equipment / Kiln Design
- (5) Commercial: Market Model Analysis / Investment / Business model / Organization / Marketing
- (6) Social impacts: Labor standard/Human Rights Impact Assessment/Health

It would be important to shape and design your overall strategy in a way that allows for these different types of actions to work together or in sequential and/or complimentary manner. Part of your responsibility in the planning and implementation of the strategy may be to help this inter-relationship of the project components to work in a logical and complimentary way.

You may also have to reach beyond the limits (and political comfort) of your own agency. It is likely that your agency alone cannot intervene in every one of these issues (it may not have the jurisdiction to do so). You may engage on developing emissions measurement capacity in your agency, but you may need to engage another governmental institution to help introduce capacity building workshops for producers (such as a Ministry or Agency focused on SMEs). Or you may have to invite a regional development bank, or your counterpart financial ministry to engage the sector with investment programs to finance innovation and change. Perhaps a Mining Ministry, or a local government may engage producers to address permitting, land-use or other locally and land-relevant dynamics of brick production. A Labor or Social Ministry may be more ideal to address informality, worker health and safety and human rights issues involving unsafe or strenuous working conditions. Perhaps a university can carry out sector studies you will need to underpin your strategy with necessary academic and theoretical justifications.

You may even have to engage another branch of government, such as the Legislative Branch, for example, to develop emissions regulations. Or perhaps your own agency can *independently* set quality standards or regulations for the sector. Each case will be different. What's important is to sort out what you can do on your own, and what will need collaboration or complementarity of others.

There are countries that have chosen to start with emissions regulations (Colombia or Peru for example) sending a clear signal to brick kiln operators that they must take stock of their emissions and probably set targets or legal thresholds to bring them down. Colombia has also tackled the challenge of establishing emissions measurement protocols as well as mandating chimney installation on kilns to facilitate emissions quantification (see: : [PAN LAC's Compilation of Policy Frameworks](#)). Mexico, on the other hand, carried out extensive analytical studies of the “economics” of the sector. Chile decided to hold a policy workshop and then proceeded to engage a local university to come up with a kiln design pilot which is currently in elaboration. Argentina, who has attempted to develop model brick production facilities has also engaged through its Labor Ministry, on the problem of child labor at kiln sites. In each, the traditional brick sector involved thinking beyond emissions measurements or control.

Beginning with strong regulations will send a signal to other agencies or levels of government (including your own) informing them that they will have to engage locally with measurement tasks, visiting kilns, taking emissions measurements, issuing fines, or providing assistance to kiln operators on the infrastructure and design needed either to measure contamination or to reduce it (or both). The message from such policy is clearly centered on a climate policy driven objective. However, if the sector is to be addressed more integrally, the message must be molded in such a way to highlight the targets, benefits, opportunities and worthiness (for all stakeholders) of wholesale sector change.

You may decide that you need more sector data in order to devise an integral or more effective strategy, and call on an academic center (such as a local or national university) to carry out a specific study about the ins and outs of kiln operations or on the economic efficiency (*or inefficiency*) of the sector.

You may decide that one of your sector strategies will include holding a series of workshops with producers about the various stages of brick production with specific training on clay mixing, on drying procedures, on burning techniques, or on marketing product. Such workshops can help promote the engagement of all stakeholders that will be essential to implement a far-reaching plan and truly secure broad sector transformation.

In an effort to help awaken brick makers/producer to the novelties of the sector, so that they may consider modernizing their production, you may decide to also promote industrial fairs where you bring producers together with machinery suppliers to introduce the sector to the latest industrial innovations and other opportunities available to them to improve their production capacity and efficiency. Such efforts are ideally accompanied by parallel meetings with financial agencies that could help with investment needs (which in turn need to be previously educated on the characteristics of the brick sector—particularly as it is often seen as “informal” and perhaps lacking in creditworthiness).

You may decide that your agency will provide (or partner with another agency or actor to provide) analysis and training on the “economics” of brick production, aiming at waking interest from producers to improve the productive efficiency of their procedure, reducing costs, better utilizing energy resources, and generally improving quality while lowering cost. This will also likely reduce the producer’s environmental footprint.

Or you may decide that you want to address, among other things, sector informality and prepare engagement, training and programs to deal with labor issues, human rights, formalization etc.

Your brick sector strategy should:

- harness your learned knowledge in the previous steps 1-7
- target your key objectives (emissions, technical capacity, economic efficiency, etc.)
- leverage your opportunities
- address the challenges that may impede successful strategy implementation

- identify, engage and collaborate with other agencies/actors that are necessary to your success
- bring key actors such as producers, finance agencies to the table to make implementation work

If your in-house team has a strong knowledge and experience with the traditional brick sector, you may be able to develop your strategy internally. If not, you may want to consider bringing in expert advisory assistance, either from the national sphere or from the international arena, as there are a number of individuals and institutions that can provide critical guidance to identify good ideas for the development of strategic plans and actions. Multi-stakeholder engagement will also be advisable to gain buy-in from the actors you are trying to influence. The wider, broader, the more inclusive and more participatory the engagement, the more likely that a national traditional brick sector strategy will be successful and most efficient to the needs and capacity of the sector.

One important dimension of a comprehensive and robust brick sector strategy, and this is an issue that is dominating much of the current development debate regarding climate change mitigation and adaptation policies around the world, is to have a clear understanding of the quantifiable “climate” nature of the tasks you are undertaking. For example, does your strategy clearly identify the “quantitative” value of existing emissions vs. the mitigating end-result in terms of the emissions reductions you are expecting as a consequence of your actions? If so, the chances are, your strategy is probably in line with the dominant international approach to addressing climate change, and may even be eligible for receiving international financial and technical assistance for your strategy at no cost to your agency.

The PAN LAC has developed a Regional Strategy for promoting public policy for clean bricks, which can serve as an important guidance document. This document can be downloaded at: <http://wp.cedha.net/wp-content/uploads/Region-Strategy-and-Report-PAN-LAC-Dec-22-2015.pdf>

Step 9: Commit Needed Resources and Political Support

Political Support

One of the biggest challenges in any government strategy, and this is certainly the case for actions involving transformation of the traditional brick production sector, particularly because it is a sector with high pollution and low present government engagement, with entrenched and long-existing production practices is securing the necessary political support to stand behind and underpin your strategy. Political engagement is often necessary because sometimes significant social and industrial transformation can generate strong resistance to change.

The political support to create, implement, monitor, finance and politically adhere over the long term to what may be a complex and significant reform, involving many actors, engaging producers, relocating industries where necessary, and in many cases, what may involve the legalization and formalization of hitherto *informal* producers (which will necessarily be accompanied by new taxation and other administrative, legal and operational costs for producers—which they may not be accustomed to paying), will be a challenging task and will need sustained political continuity and resolve.

Without convinced political leadership in your strategy, wholesale policy, structural and legal changes will be difficult to achieve. Sometimes revamping brick production may mean putting some producers out of business, or can imply strict regulations that are hard to achieve without a tough crackdown on polluters, involving politically sensitive fines or industry closures and/or relocations. These types of actions are always

hard to sell to political leaders who are sensitive to public pressure against tough measures. The likelihood of political support may also depend on the political electoral cycles in process.

If the nature of brick production contamination is so significant and the public call for reducing emissions is strong, or if it is a component of a larger strategy (a climate change strategy, for example) it may be easier for political leadership to take stricter actions that mandate technological investments, emission compliance, kiln design changes or large sector shifts.

Whatever the context, significant changes will require significant political capital to guide and introduce innovations, and this “political” context should be considered for any strategy.

Financing

The question of financing always accompanies policy discussions for the traditional brick sector. It’s generally not a question of “if” financing will be needed to implement a brick sector strategy, but rather “how much”. The needed investments to modernize your traditional brick sector may range from small and easily mobilized investments, to rather large capital investments that may not be achievable without active engagement of private sector financial agents.

Most of the types of actions that can be taken in the traditional brick sector to reduce emissions will require some level of financing to cover the costs of introducing new technology, equipment, and for designing and building new kilns that burn more efficiently and emit less contamination. Emissions controls carried out by local or regional government agencies require emissions measurement equipment, capacity building to work the equipment and what may be an extensive network of “controllers” that may need multiple sets of equipment that local governments will need to have and maintain in order to effectively use the equipment.

Investment needs for production, targeting innovations to traditional brick production have varying levels of financial needs. Some of the technical options can involve low-cost investments such as introducing low-cost blowers (such as the hand held units used for pushing leaves over the ground in gardening operations) for burning efficiency improvements, which are likely to have a unit cost of under US\$1,000. A regional program to retrofit existing producers with blowers for 500 producers might cost US\$250,000 – \$500,000, assuming there are no significant capacity building/training costs.

Investments in improving clay mixing and preparation, or in mechanical pressing of bricks (through the use of *extruders*), can range in the few thousands of dollars per unit cost. Consider that fitting 500 producers with extruders and mixing machines will likely cost in the range of several million dollars (500 producers at US\$5,000ea, = approximately US\$2,500,000).

Larger investments in the tens of thousands of dollars are needed for wholesale kiln redesign and more modern kiln construction. Building a single low-emission kiln might cost a producer \$50,000 – \$100,000. It is unlikely that a government program will aim to convert 500 producers from traditional clamp kilns (the most contaminating) to 500 modern low-emission kilns. But even a program that aims to fully convert only 50 producers to fixed and more efficient kilns would cost in the neighborhood of US\$2.5 million; addressing 500 producers would be 10 times that amount.

Whatever the nature of the investment needs, your agency will have to consider the financial implications of the transformation you are seeking. If you suddenly introduce strict regulations mandating the lowering of emissions, but the local municipalities charged with monitoring and measuring emissions do not have the equipment nor the financial capacity to purchase such equipment, it is not likely that you will see compliance

with the regulations. If producers are forced to introduce measures to lower emissions, but they cannot afford to build a new kiln to code, or they cannot even afford to make small basic technical adjustments to their production (or simply they do not have the knowledge of how to do this effectively or at low cost) you will force producers into non-compliance with the law, generating conflict and social and political tension with the sector.

Other Considerations

Another systemic problem that has been encountered in many countries interested in transforming the traditional brick sector is the widespread *informality* of the sector. In most cases, this implies that traditional brick producers already live at the fringes of formal society, are generally poor, and without property or other valuable assets and hence do not have access to credit. For such producers, even obtaining a small loan of a few hundred dollars to purchase a blower or a few thousand dollars to purchase a mixer or extruder (a brick press), may be a big challenge.

For low-cost investments, the fast and very tangible and immediate results of adding a blower to an existing kiln, can reduce fuel costs by 30-40%. In such a scenario, depending on the size of production, an investment of 500 dollars to purchase a blower, can be recuperated in a single season by the saved costs for fuel. In such cases, producers may not need any government assistance to finance investments, but rather, they may require instead, technical training to understand how to adapt the blower to their traditional kiln. Your agency may be able to more easily obtain expert personnel or a qualified non-governmental organization working in the brick sector, to provide such training at little or no cost. The CCAC has provided such training through its field partners in Latin America and Asia.

Mid to large investments will clearly require more significant financial investment assistance, which will likely not be available to small local brick producers, again due to their informality and economic level. In these cases, your brick sector strategy will probably need to include engagement or building partnerships with the financial sector, perhaps with a regional public or semi-public development bank, or with a group of local private or public banks, to introduce the financial agents to the brick sector, explain the brick production process, the rationality of the targeted investment, to show the economic benefits that will accrue to the producer, and help build a bridge between the financial market and the producers. Possibly, a local small business organization or a micro-finance type financial operation is available to utilize for this type of relatively small investment into the sector.

For larger investments, such as new kiln construction ranging in much higher unit cost amounts (50,000 – 100,000) your agency might consider financing a single or a handful of projects, in order to show the viability of the idea to other producers. Perhaps financing one kiln redesign that can show a community of traditional brick producers the economic, social and environmental benefits of transforming the technology how bricks are made including the scale of production that would have been previously untenable by the producer. Where the social characteristics permit, it may be possible to consider fostering the unification of small producers in a cooperative fashion, to collaborate in the needed investments and in the eventual business model involving a larger unit of production. The Mining Ministry of Argentina is currently engaged in such promotion.

Step 10: Final Thoughts and other Outreach Opportunities

We have gone over 9 steps to developing a Traditional Brick Sector Strategy with a view to reducing emissions from traditional brick production and also improving the social, environmental and economic sustainability of the sector.

CCAC Resources

As we have indicated throughout these Guidelines, the [Climate and Clean Air Coalition \(CCAC\)](#) and its over 100 members (member countries, intergovernmental agencies and non-governmental organizations) has a number of studies, references, expert contacts and other resources to assist your government to prepare for, develop and implement and Traditional Brick Sector Strategy. Furthermore, beyond bricks, the CCAC in conjunction with its membership also has a number of initiatives, in areas such as transport, municipal waste management, agriculture, cook stoves, and in the oil and gas sector, to explore ways your government can address the reduction of other non-CO₂ gases. These initiatives may be in your jurisdiction to address and your government may consider (or already may be considering) addressing other areas beside brick emissions reductions. The CCAC is poised to assist this process and can provide a wealth of technical, analytical and financial guidance and support to develop and implement emissions reduction strategies that look beyond bricks.

International Aid

With a view to tackling climate change, the international community has been gearing up to identify and promote cleaner industrial practices. The CCAC itself has a financing mechanism of projects its membership chooses to finance to promote the implementation of strategies and programs that derive from the work promoted by its initiatives. Your government, as a member of the CCAC can approach the membership with individual country proposals or participate in ongoing initiative projects to request financing to develop your strategy and place them into motion through implementation plans.

Additionally your country can seek the assistance of the CCAC, its membership and individual expertise to guide and assist your government in funding requests to other governments and aid agencies for these ideas and proposals. .

Another venue for financing of traditional brick sector strategies and programs that your government might explore are the various international aid facilities designed specifically for financing actions to reduce emissions and address climate change. The [Global Environmental Facility](#), the [Green Climate Fund](#), and the [Climate and Clean Air Coalition \(CCAC\)](#) are all existing mechanisms that can provide technical assistance and/or financing to tackle some systemic challenges that you are seeking to achieve in the traditional brick production sector.

Intergovernmental financial institutions such as the World Bank and the Inter-American Development Bank are also actively engaged with the CCAC, are aware of the various CCAC initiatives underway (including the Bricks Initiative) and the CCAC can be a nexus bridge between your government and these agencies on matters involving traditional brick sector strategies and programs to reduce contamination from the sector.