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Energy efficiency in the brick sector: a path to mitigate climate change



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The brick industry is important for Latin America's economy, but generates environmental impacts. Enter the EELA programme which aims to reduce the carbon footprint of traditional brick making, while at the same time improving the businesses of local artisans.

The SME brick industry in Latin America uses inefficient technology and high fuel consumption that leads to significant emissions of greenhouse gases (GHGs), particulate matter (PM), black carbon (BC) and other pollutants.

There are around 45,000 small and medium-sized enterprises (SMEs) who are brick producers in Latin America. Low technology levels in the region is reflected in the low levels of brick kiln capacities and production, with the exception of Brazil and Colombia that have production areas with semi-automatized technology and more efficient kilns. In Peru and Bolivia the picture is mixed, some brick producers have implemented improved technologies, others still use manual production processes.

The Energy Efficiency in Artisanal Brick Kilns in Latin America (EELA) programme initially focused on the development and validation of energy efficient, non-complex technological options for the sector. In a second phase, which is currently taking place, the scaling-up of technology is promoted in six countries: Bolivia, Brazil, Colombia, Ecuador, Mexico and Peru.

Low technology levels are related to the emissions of air pollutants. EELA first investigated suitable technology options to reduce emissions, such as operational controls to prevent heat loss, improved combustion processes, and efficient kilns among others. This led to a transformation in the production process, reducing fuel

consumption (less firewood) and raw material, manufacturing times and improving product quality.

However, the solution was more complex. The technology market was not prepared to generate the supply and demand needed for the scaling-up of this technology, limiting the environmental benefits to a few brick-producing units. EELA's second phase (2013-16) is focusing on overcoming market constraints to scale-up efficient technology.

From the planning of the EELA project a systemic market-driven approach was considered with a focus on how to generate sustainable, effective and large-scale changes. EELA adopts a facilitating role that seeks to influence the market without becoming part of it.

To start, a thorough market analysis of the brick-making sector and technology suppliers was done with local and national market studies in each country of EELA's intervention. This included surveys, interviews and secondary information in order to have a good understanding of market actors, the supporting functions and rules governing the market system. It also helped identify the underlying constraints that were preventing the modernisation of the brick industry.

Logic of intervention

Promotion of demand: The promotion of the demand of efficient technology is done by selecting affordable and profitable technological options in line with the SME profile, and specific economic and financial analyses determine the net present value (NPV) and return on investment (ROI). EELA did the initial demonstration and promotion about the benefits of technology, and this has been adopted by the technology providers.

Promoting the supply: a transparent business opportunity is shown to technology providers which includes information on the potential demand and characteristics of the appropriate technology. Initial support is provided by EELA with field demonstrations to avoid distrust and reduce the sense of risk among brick producers. A south-south exchange is also considered for providers to show how other Latin American countries are upgrading their technology.

Promoting credits: the potential demand is also shown to selected financial entities, this includes economic and financial analysis for investing in efficient technology. A key issue is to demonstrate the cash flow and the return of investment.

Technology adoption: the adoption of technology by the SMEs has followed the model proposed by Everett Rogers, starting with the earlier adopters and a take-off at different rates depending on the country.

Technology options: it is also important to consider the level of complexity, investment and the potential of GHGs reductions for each technology. These factors will determine how easily the technology could spread in the sector and the impact achieved.

Impacts: in more market-driven economies the market adoption takes place much faster. In Brazil, Peru and Colombia crowding-in has started, in Bolivia and Ecuador technology is ready but adopting is slow. Mexico is a special case, in some states such as Jalisco and Puebla crowding-in has taken place but in other states – where the government subsidises technology – the market forces do not play.

Signs of change

A positive change in the market system is that a significant number of technology providers are offering affordable options to brick-making SMEs. This is in line with improved access to credits.

The role of the market facilitator played by EELA has been based on reducing the risks or sense of risk perceived by market actors, who now assume new functions in the market and push out the technology access frontier to SMEs. Additionally, new market opportunities have emerged with the improvement in the quality and price of products, and more efficient resource use including in fuels, clay and water.

One lesson learned is that regulations are also an important driver for technology improvement which together with market promotion has been successful in Colombia for the implementation of new kilns, and progress has been made in Brazil.

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> [Programme Index entry: Energy Efficiency in Brick Kilns in Latin America \(EELA\)](#)