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FINAL EXTERNAL REVIEW

ENERGY EFFICIENCY PROGRAMME FOR BRICK KILNS IN LATIN AMERICA TO MITIGATE CLIMATE CHANGE (EELA)

Elaborated by

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Executive Summary

SDC has commissioned a final external review of Phase II of the “Energy Efficiency Programme for Brick Kilns in Latin America to Mitigate Climate Change” (EELA) which has been implemented from 2013 to 2016. The purpose of the review was both to assess EELA’s performance against its objectives and to examine the underlying reasons for its performance, so contributing to learning for the future.

Performance

EELA has surpassed its overall headline targets. It is projected that GHG emissions will have reduced by 995,000 tonnes and costs savings of more \$14m been achieved by the programme’s end. Compared with Phase I, impact has scaled up more than fifteen-fold and been achieved more efficiently. Only in Bolivia, where performance was undermined by a number of discernible factors, has the programme not met its targets while the greatest achievements have been in Brazil, Mexico and Colombia.

EELA’s main success has been in the development of the technology services market on a national and regional basis, which has driven investment in new ‘greener’ and productivity improving processes. This has been supported by development in financial services. These changes have improved the efficiency of the overall market and, in places, instigated a process of small-scale industrialisation. However, the single biggest contributor to GHG reduction during the programme has been the new kiln investments of a small number of relatively large Brazilian producers.

Most of the change achieved is genuinely additional and, because it is aligned with private sector incentives, is sustainable and can be expected to grow further. However, some of the change observed – where it accelerated processes that had already started – would have happened without EELA

Notwithstanding EELA’s success in relation to its targets, the GHG reductions achieved still amount to only 9% of total sector emissions. Overall, change achieved has not yet been *transformative*, moving the sector to a higher level of environmental and productivity performance. Ultimately, this will not happen without more enabling public policies in Latin America. Only in Colombia and Brazil, which have stronger institutional structures, is there a discernible path to this transformation.

Factors underpinning performance

Several factors can be cited to explain this picture of performance. From a positive perspective, EELA’s adoption of a market systems approach has generally been successful. Its ambitions have been raised and interventions been implemented in accordance with good practice guidelines. Moving to a systems approach built on the achievements of the Phase I pilot work. The benefits of a regional programme structure, mirroring the regional nature of the technology market, have also become clear.

Limitations in performance can also be explained by the partial nature of EELA’s interpretation of a market systems approach. Initial market analysis did not focus sufficiently on underlying systemic constraints; each country programme has not articulated a future vision of the sector to guide interventions; systemic change has, at times, been subordinated below pursuit of headline targets.

EELA’s work in public policy has generally not been as successful as in other areas. Generating change in the public policy space is inherently challenging by its nature - particularly the political incentives involved, the realities of government capacities, and the time required to stimulate change. But EELA’s work also suffered because public policy was not assessed using the systemic framework as was employed in other areas (such as technology), which limited the scope of subsequent interventions.

Performance was also affected by organisational functioning and resource allocation. Especially given the clustered nature of the brickmaking sector, more ‘on-the-ground’ resources - rather than at the Coordination Office (CO) - would have helped the programme’s spread within countries. The information and knowledge base created by the CO has not always supported country performance adequately.



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Learning

EELA is an important experience for SDC and for the wider development community. In addition to its headline success, and strong potential for sustainability, the value of EELA lies in the learning to be derived from it. This review has highlighted key points of learning, especially the potential benefits of adopting a systems approach and using regional implementation structures. However, in order to extract the most value from EELA, a detailed learning case study of the experience should be undertaken. Without this there is a danger that EELA's real benefit is not achieved.

1. Introduction and context

In October 2016, Alan Gibson¹ was commissioned by the Swiss Agency for Development and Cooperation (SDC) to undertake a final external review of Phase II of the “Energy Efficiency Programme for Brick Kilns in Latin America to Mitigate Climate Change” (EELA) implemented by Swisscontact. The overall purpose of the review was to “assess the consolidation strategy of the EELA Phase II”, and specifically to:

- “Make a critical assessment of the extent to which the objectives have been achieved”, and
- “Help to identify factors that have facilitated or hindered the success of the project”.

The methodology for pursuing these objectives followed the guidance given in the terms of reference. Following a review of relevant documents, the review team undertook field work in three – Bolivia, Peru and Mexico – of the six countries in which EELA works, these being selected to cover the diversity of the programme’s experience, and conducted remote interviews with the other three, Ecuador, Brazil and Colombia. In addition remote discussions were held with other stakeholders in SDC in Bern and with the Climate and Clean Air Coalition (CCAC).

This report contains the findings of the review. It is structured as follows.

Section 2 provides a brief analysis of the programme against the five standard evaluation criteria set by the OECD’s Development Assistance Committee (DAC): relevance, effectiveness, efficiency, impact and sustainability. The DAC criteria are the first ‘lens’ through which EELA is viewed.

Section 3, given that EELA seeks to follow a market systems approach in its work, explores the underlying ‘why’ factors that explain the programme’s performance by examining EELA’s experience using a market systems framework, the second lens for viewing EELA.

Section 4, outline the main conclusions from the review against key questions raised in the terms of reference.

Section 5 outlines the key lessons to be learned from this experience which have wider applicability for development programming by SDC and other agencies.

Annex 1 contains the review terms of reference, Annex 2 the schedule for the review including a list of key organisations contacted and Annex 3 more detailed notes against the thirty-five specific questions raised in the terms of reference. Last, Annex 4 provides more detail on how to apply a systems approach to the public policy space.

At the outset it is important to establish a few caveats and points of clarification. First, the report is written for SDC; it therefore assumes that the reader has considerable prior knowledge of the programme; there is no attempt to explain EELA’s (complex) background. Second, while the core of the report is concerned with assessing performance against targets – ie providing an accountability function – it also gives considerable emphasis to the wider implications of EELA for the future – ie to the learning that emerges from the EELA experience. Third, the report’s findings have been reached within the restrictions set by the resources available for the review – while the whole programme has been examined, the review draws particularly from those three countries visited. Fourth, in accordance with the terms of reference, the report is also written in a succinct style.

Last, before proceeding with the analysis of the main report, the wider context and significance of EELA should be recognised. EELA is notable in a number of respects. It represents a considerable investment for SDC. Phase II of the programme, the focus of this review, began in May 2013 with a budget of CHF7.8mio². Phase I (2010-2013) cost CHF 4.7m. Before that, the PRAL Regional Air Programme, also implemented by Swisscontact, ran for five years from 2004 to 2009. More widely, SDC has funded activities related to brick making for several decades. EELA Phase II therefore is a substantial investment in its own right, the largest initiative in brickmaking globally for SDC, but also one that represents the culmination of learning and experience over many years.

¹ The review was undertaken by Alan Gibson and Kate Fogelberg

² CCAC provided an additional \$0.25m

EELA also represents a programme which, consciously, has sought to take a different approach from the norm. The Phase I Review highlighted its limited achievements to-date. From this, came a determination to re-orientate the programme towards a systems approach which, it was believed, would offer the prospect of greater scale and sustainability. In doing so, SDC was drawing on the agency's broader experience with market systems approaches, and in particular with *Making Markets Work for the Poor* (M4P), where it has been one of the leading agencies. However, while the scope of M4P interventions has broadened to embrace many fields, there are still few examples related to climate change/the environment. A systems approach for EELA Phase II therefore represented a notable innovation from which many others, potentially, might learn.

Like its predecessor, EELA Phase II has also been a regional programme, with a central Coordination Office (CO) and six national offices. Increasingly, such regional programmes are important: in principle, they provide more cost effective ways of addressing common international issues (such as clean air and climate change) which, in an era when Swiss bilateral aid is reducing, rely less on 'direct delivery' but on facilitating the energies and expertise of other stakeholders, both in the private and public sectors, and on strengthening interconnectedness between nations. For Swiss aid, and for other donor agencies, regional programmes may increasingly become the 'norm' in aid projects.

For these reasons, EELA's significance goes beyond that usually associated with moderately sized three-year aid projects.

2. Performance against the DAC criteria

This section summarises EELA performance through the lens of the standard DAC evaluation criteria. It provides an overarching view - Annex 3 gives an expanded picture that addresses more specific points under each heading in accordance with the terms of reference.

2.1 Relevance

The extent to which the programme – its objectives, approach and activity – has been relevant to overall development goals.

The objectives of EELA are first to reduce greenhouse gases (GHGs) from brickmaking and second, in doing so by enhancing their efficiency and competitiveness, to increase brickmakers' incomes. Climate change is still a relevant and valid area of activity for development programmes. Indeed, the recently ratified Paris Agreement within the UN Framework Convention on Climate Change (UNFCCC) has strengthened the global 'push' to reducing GHGs. Although only three of the six countries in the EELA programme are signatories to the CCAC, all six have signed the Paris Agreement. The specifics of individual country targets (Nationally Determined Contributions) vary but generally aim for a 20-30% fall relative to a 'business-as-usual' scenario by 2030. The overall direction of travel for policy has been set. Since brickmaking is a major cause of air pollution in Latin America and a major source of GHGs, it is a logical and valid area of focus. In this sense, EELA, concerned with the 'how to' of GHG reduction, is clearly relevant.

EELA of course is concerned both with environmental and economic goals. This reflects the orientation and incentives of different stakeholders engaged in the brickmaking market system – and the reality that environmental goals cannot be pursued in magical isolation from the real world of people's livelihoods and incomes. Brickmakers, when discussing benefits from technological changes, articulate these primarily in terms of 'the economic' – cost reductions, process improvements, better quality, higher margins – and not in terms of the slightly more esoteric 'environmental'. EELA is grounded in this real world where there is always an economic perspective.

This grounding is at the heart of the approach used by EELA. Among the key underpinning principles of the market systems framework is pursuit of underlying causes ('systemic constraints') and ensuring that interventions align with incentives. Its claim to have the ambition and potential to bring about more sustainable and larger scale change than conventional 'direct' approaches – changing the system and not just individual players within them – is derived from these characteristics. Indeed, in part at least, the higher targets of EELA II compared with EELA I is a reflection of this ambition. Phase I sought to reduce GHGs by 76,000 tonnes; in Phase II these targets had increased eleven-fold to 850,000 tonnes. But the real goal of systemic approaches is inclusive change that continues – making sustainability 'real' – and this fits closely with the essence of climate change concerns.

If EELA's objectives and overall approach *in principle* therefore remain strongly relevant, however, the acid test for the extent to which EELA *in practice* is relevant is of course determined ultimately by how well it performs – and this is assessed in more depth under the other four DAC criteria. For now however a number of points can be made regarding EELA in practice. EELA's main targets at an intermediary level are stated to be technology service providers, finance providers and public policy changes. However, closer examination of the targets for these show sizeable contradictions between figures in the programme logframe and those included within results chains³. This can be attributed to three main factors:

- A degree of arbitrariness about these targets. Given the limited nature of the initial market analysis, some of this is inevitable and ideally these should have been altered as the programme was implemented. However, it doesn't especially matter if – as in Bolivia where against a target of twelve finance providers, three were actually engaged - a momentum for sustainable change has been developed.
- Limited use of results chains. While results chains were developed for each main intervention, there is less evidence that these were used actively as a management tool by country teams.
- The priority given to the headline GHG and income targets rather than intermediate goals. While this is understandable to a degree, changes at an intermediate systemic level are the means to reaching final objectives and where the systemic heart of the programme is located. Neglecting this undermines the approach.
- A lack of priority given to systemic change in programme monitoring is shown in poor data reliability. The MONELA system is primarily concerned with generating 'headline' figures on GHGs (especially) and incomes to fulfil accountability requirements to SDC. It offers limited value as a management tool. The review team were struck by the many examples of discrepancies between data at a country and overall programme (MONELA) level.

Of course, to be successful, market systems approaches, by their nature, need to be adaptable to emerging circumstances. Blueprint prescriptions of outputs and activities cannot be expected to be precisely correct – adaptation in the light of experience is always required. However, it is precisely because of the need for flexibility that information and monitoring systems need to be rigorous – but this is a failing currently.

2.2 Effectiveness

The extent to which the programme has achieved its objectives

Table 1 shows EELA's performance in relation to its two main targets of GHG reductions and income growth and Table 2 looks at GHG performance in relation to overall sector GHG output.

Table 1: Programme performance against targets*

Country	GHG reductions			Income increase		
	Target ('000 tonnes)	Actual ('000 tonnes)	% achievement	Target (\$000)	Actual (\$000)	% achievement
Bolivia	84	51	61	2015	1384	69
Brazil	441	494	112	4196	2203	53
Colombia	47	136	288	791	1610	204
Ecuador	13	21	161	177	330	187
Mexico	156	193	117	1368	7548	550
Peru	109	100	92	2116	1320	170
Total	850	995	117	10662	14445	136

³ For example, for Mexico, in the logframe target for technology service providers is 6. Their achievement against this target is noted as 16. However, according to the results chain the target for service providers is 20 and their achievement is 30!

*These are preliminary (at October 2016) – not at programme end. There is particular uncertainty over the income figures for Mexico which account for more than half the total.

From Table 1, the most salient point is the programme's relative success. By the time the programme is complete, it is likely that in five out of six countries it will have achieved or surpassed its targets. EELA has reduced GHGs by 15 times the amount achieved in Phase I. Within this overall picture, more than two-thirds of this reduction comes from two countries, Brazil and Mexico. While Bolivia is below its targets the trajectory of change here is upward and likely to reach target within one year.

However, a number of caveats should be noted.

- The process through which the country targets were set comprised of discussion and negotiation between country partners, Swisscontact and SDC, taking account of the pilot experience. The targets arrived at were deemed to be reasonable and achievable and were approved by the Steering Committee. However, as seen in Table 2, they appear to represent different levels of ambition.
- The brickmaker 'income' term is problematic. This is calculated as the cost savings resulting from efficiency improvements arising from technology or process changes that EELA has facilitated. This is an important measure of brickmaker efficiency and productivity. However, brickmaker incomes are a function of not just process efficiency but other factors – notably output and price which themselves are influenced by many other variables. It is misleading to term this, without any qualification, 'brickmaker income'. It is, as best, a proxy measure of income but cost savings from efficiency gains or process improvements would be a more accurate term.
- In the absence of a reliable counterfactual, it is not possible to ascertain what proportion of these impacts are genuinely 'additional' – ie they would not have happened without EELA. In some cases, it seems likely that EELA has accelerated an incipient trend – for example in Puebla Mexico where EELA's intervention built on growing interest (and transactions) in fans and coincided with increased demand from the construction sector. In other cases, for example in Bolivia, EELA's intervention has played a kick-starting catalytic role.

Table 2: GHG reductions in context of the sector total

Country	Sector emissions ('000 GHG tonnes)	Target GHG reductions as % of sector total	Actual GHG reductions as % of sector total
Bolivia	930	9	5
Brazil	3675	12	13
Colombia	676	7	20
Ecuador	262	5	8
Mexico	5198	3	4
Peru	779	14	13
Total	11523	7	9

Beyond these caveats, what factors lie behind this picture? This is explored further in Section 3 but for now the following can be noted.

- EELA's main success has been in stimulating the technology markets related to brickmaking – such as fans and extruders. It has done so not through the instant panacea of one activity but rather through a series of related interventions – usually beginning with regional exchange visits to create awareness and then supported by demonstration initiatives and some technical assistance to providers. EELA has been instrumental in creating a technology services market for the brick sector.
- EELA's main weakness has been in relation to public policy. There are positive examples of EELA helping to 'nudge' local governments into more brickmaker-friendly actions in support of already-evident private sector change. And in Brazil and Columbia, where EELA's implementing partners are close to government and where the most conducive regulatory environments for the sector

exist, EELA inputs assisted in positive revision and implementation of regulations. But overall it has recorded much less success in relation to the bigger national policy space.

- Bolivia's relatively weak performance can be attributed to a number of factors of which the most important may have been mismanagement and weakness in execution in the first of the three years of the programme.

2.3 Efficiency

The level of programme inputs required to achieve programme outputs.

The main measure of efficiency for EELA in Phase II is the same as in Phase I, namely the cost per tonne of GHG reduced in each country and for the programme as a whole. Since more than half of the EELA budget is actually allocated to the CO it is necessary to reallocate these costs to individual countries. In the absence of a system for accounting for CO costs, in Table 3, these costs have been allocated equally between countries and assuming therefore that CO efforts were equally split⁴. The exception here is Bolivia which has its own separate budget and which, in any case, received comparatively little CO attention.

Table 3: Imputed cost of achieving benefits

Country	Cost (\$)/GHG tonne-reduced	Brickmaker income increase (\$)/Cost
Bolivia	52	0.52
Brazil	2	1.8
Colombia	7	1.6
Ecuador	43	0.36
Mexico	6	7.1
Peru	11	1.2
Total	8	1.8

From Table 3, a number of points stand out:

- In terms of GHG reductions, Brazil is the most efficient country and Bolivia the least efficient.
- In Phase I, the calculated figure was \$79 per tonne GHG-reduced, 10 times more than in Phase 2⁵. Although this is to be expected given the pilot nature of Phase I and the move to a systems approach, nonetheless, the efficiency of the programme has improved markedly in Phase II.
- Although this is not a full cost-benefit analysis, overall, it offers a snapshot view. There is a positive benefits to costs ratio⁶. For every \$1 spent approximately \$1.8 has been generated.

Behind these overall figures, were EELA's resources used efficiently? In this connection, two obvious areas of concern stand out and require comment: the position of Bolivia and the CO.

Why is it that the experience in Bolivia has, apparently, been so different? Three reasons can be cited:

1. Directly funded by SDC's bilateral programme with a budget of CHF2.6m, EELA's Bolivia programme, even allowing for greater CO support to them, has had four-five times more resources available to it than other countries! In general, the pressures to spend wisely have been much less prominent in Bolivia. It has been able to spend more – and it has – for example by having 5-6 staff against, typically, less than half this elsewhere.

⁴ This is obviously a simplification. An alternative method of cost allocation would be to do so on a pro-rata basis in relation to GHG targets but there is nothing to suggest that this would be any more accurate.

⁵ The current cost of carbon is less than \$5 per tonne but since most carbon trading initiatives are in a moribund state this is a spurious comparison

⁶ Future income/cost savings streams have not been taken into account here so a full cost benefit analysis, even discounting to take account of factors such as attribution, would produce a more positive ratio.

2. Unlike any other country within EELA, the Bolivia programme decided from the outset to subsidise technology purchase (especially fans) directly by up to 50%. Even although the size and nature of this subsidy reduced beyond the first year it represented a large, unnecessary and mainly counter-productive expenditure.
3. Frustrated by the significant constraints on brickmakers from the regulatory and policy environment the Bolivia programme embarked on a mission, midway through the programme, to address this through a set of interventions aimed at enhancing government's role, for example, developing government policy and improving spatial planning capacities in government. These interventions were, consciously, seen as having a longer-term perspective, which would not generate measurable short-term results that could be 'counted' by EELA. They were also undertaken at considerable cost.

In relation to the CO, this accounted for CHF 2.9m, 37% of the total budget, and 56% of the budget excluding Bolivia. Clearly, this is a considerable proportion of overall resources – but how has it been spent? The CO budget identifies a number of broad functional areas, including coordination, communication, exchange and training, as well as specific tasks including the programme's endline survey. In addition, specific positions in the CO have specialised responsibilities attached to them. However, overall, in general these are broad descriptions which provide limited light on how resources are used. In particular, CO personnel costs (the CO's main resource) are not allocated to tasks – for example through a staff timesheet system. Of course, internal systems that are too intrusive and time-consuming are not helpful but nonetheless there appears to be a lack of clarity that may hinder effective management decision-making and resource allocation. For example, the development of PEFAT has been a major focus for the CO. Irrespective of the efficacy of this – see section 3 – the costs of developing it are not really known.

The single biggest item within the CO (and the total EELA) budget is the cost of the EELA expatriate director. The combined salary and benefits (including overhead) for this position amounts to over CHF 1.04m - 36% of CO costs. Clearly this is an important position. Moreover, it is not unusual for expatriate team leaders in aid projects implemented by international contractors to account for a large proportion of expenditure – it is a recognised feature of the business model. However, the argument for such a cost structure is generally strongest where there is a shortage of skills and experience locally – often in low-income countries. The argument is much weaker in middle-income countries with a strong human resource base, such as applies in Latin America.

2.4 Impact

The wider changes, positive and negative, produced by the programme.

As can be seen from earlier, EELA has broadly met its targets in relation to GHG reductions and brickmaker cost savings from efficiency improvement. Beyond these headlines, what else can be said about the impact of EELA?

First, as can be seen in Table 4, EELA has stimulated change – investments and/or changed practices - in approximately 3600 brickmakers, or 11% of the total. There is a momentum supporting investment in technologies – EELA estimates that brickmakers have invested \$32m during this phase of the programme – but the overall numbers of brickmakers reached is slightly less than was anticipated. Of particular note here is small number of producers reached in Brazil – where half the GHG reductions have been achieved. Indeed, the single most important factor in the overall 'success' of EELA has been the programme's facilitation of change in a relatively small number of large Brazilian producers.

Second, these changes do mean that the brickmaking market is overall working slightly more efficiently. Interventions from EELA have reduced transactions costs in particular by mitigating information asymmetries – for example through south-south exchange and demonstration activities. Although difficult to measure separately the efficiency gains and productivity increases resulting from should result in higher quality and lower prices to consumers. Anecdotally, for example in the San Jeronimo cluster in Cusco, this is happening.

Table 4: Change in the brickmaking sector: brickmakers reached⁷

Country	Number of brickmakers changing behaviour		Proportion (%) of sector	
	Target	Actual	Target	Actual
Bolivia	730	473	27	7
Brazil	800	112	11	1
Colombia	144	96	11	6
Ecuador	500	216	29	18
Mexico	1612	2201	10	13
Peru	640	527	29	10
Total	4426	3625	14	11

Third, and the flip side of a more efficient market, in some cases, EELA has helped to instigate the early beginnings of small-scale industrialisation in the brickmaking sector. Given that artisanal brickmaking is still an elemental, basic process (literally manually digging, shaping and then burning the earth), there is great potential for major improvements through utilising relatively low-risk technologies. This process involves producers becoming aware of new ideas and opportunities; investing in new technology/processes, reaping the resulting productivity gains and in the process

improving environmental performance, in turn encouraging further investment. Fortunately, in brickmaking the technologies promoting productivity gains are also more environmentally-friendly – there is a virtuous ‘win-win’ relationship between economic and environmental goals. Although development is not uniform and tends to be concentrated in particular clusters (Box 1), there are signs that the industry is changing. For example, in Peru, one-quarter of producers have invested in new technology while in Mexico the figure is 12%. And in Ecuador, within the main Cuenca cluster, from a position in 2010 where 92% of producers were artisanal and made little use of technology, six years later, 85% of producers have now changed practice. EELA has been instrumental in facilitating this process.

Box 1: The localised nature of brickmaking

Brickmaking occurs in clusters, often nearby clay deposits, in all of the EELA countries. This leads to some clusters developing at faster rates than others, often due to non-tangible reasons of “more entrepreneurial” contexts, or cheaper inputs or favourable construction market conditions.

Puebla, Mexico, was already on the path to using fans as part of shift from oil to sawdust nearly 10 years ago. Having experienced little response in another EELA shifted its focus to Puebla and was able to capitalise on this more enabling environment. They were able to reach their goals quickly once they focused efforts in Puebla.

Fourth, although the industry is still substantially divided in each country by size (big/small) and legal status (formal/informal), use of technology in particular has begun to blur this distinction. In Peru and Bolivia, small producers report that they are increasingly competing with (and coming to the attention of) large enterprises because of improvements in their product quality and price achieved through technology adoption. This mainstreaming of small brickmakers, where – like larger enterprises – they have become more visible to national and regional technology providers, is a key achievement of the programme.

Fifth, the programme has been successful in stimulating more commercial finance for brickmaking activities. 390 loans from banks have been facilitated by the EELA. Among the key interventions here were the PEFAT, an analysis and planning process that generates useful information on the potential profitability of and demand for different technologies as well as the credit worthiness of the brickmaking sector. EELA spent considerable time gathering data to feed into PEFAT to ensure its accuracy. PEFAT served a number of purposes, including improving the understanding of EELA personnel of brickmaking as a business and helping them engage more effectively with producers, service providers and banks. PEFAT was least successful as a software tool for banks to analyse the detailed costs and potential revenues of brickmaking investments, especially different types of kiln, which they could use themselves in making decisions on loans. However, in practice, the review team

⁷ Figures were provided from the programme in early November 2016 since MONELA only tracks enterprise change at 6-month logframe updates.

found that only in Brazil did banks use PEFAT, which reflects the nature of investments being made there. Elsewhere, most were comfortable with their own loan assessment processes.

Last, to what extent has EELA addressed cross-cutting issues that affect brickmaking and other spheres of activity? Two of the most prominent issues identified by several country programmes are business formalisation and spatial planning⁸. However, little progress has been made in addressing these. With more than half of workers in Latin America being employed in the informal economy, this is hardly a problem confined to brickmaking. And even though it undermines producers' ability to access services and enter 'formal' markets, the perceived costs of formalisation outweigh the benefits for many. Spatial planning capacity and practices is a problem more specific to brickmaking but, currently, there exists little appetite among local government/municipalities to change this. These remain significant generic problems.

2.5 Sustainability

The degree to which benefits are likely to continue after the programme has been withdrawn.

Given that the programme has achieved its overall impact targets, is this change likely to continue after EELA? More specifically: (1) is the brickmaking market functioning in a more sustainable manner? (2) will it work better for more people? and (3) is the market set for change that is 'transformative'? – ie moving to a different level of value-added and benefit? Each of these is considered in turn.

Is the market functioning in a more sustainable manner? The driver of change in the brickmaking sector has been improved services from technology providers (mainly) and to a lesser extent finance providers (see table 5). The programme has worked to develop the awareness and capacities of these suppliers among brickmakers. More important, from a sustainability perspective, change here builds on the clear commercial incentives providers have to provide services/equipment and brickmakers have to invest in services/equipment. Moreover, it is clear that the technology market is regional – led by Brazilian and Colombian companies – and that a range of mutually-beneficial supply-side arrangements are developing (see Box 2). The programme has played an important role in developing this technology services market, and given the incentives in place, further development is likely.

Box 2: New business collaborations

Trade fairs have been instrumental in linking brickmakers, banks, and technology providers in all EELA programmes, but in Mexico, the brokering facilitated by EELA has led to an especially promising alliance. Josue Morales, a manufacturing specialist, and Gustavo Juarez, a brickmaker and electrical engineer met at the second trade fair and have formed a business alliance between Josue's company ALTECSUS and Gustavo's Ceramica Santa Fe.

With Gustavo's expertise in the brickmaking and his electrical engineering skills, coupled with Josue's manufacturing knowledge and equipment, the two are developing new products for the brickmaking sector, without the support of EELA. The largest cooperative in Mexico, Caja Popular, is further interested in offering finance for pre-approved technologies manufactured by the alliance, replicating similar financing mechanisms that Caja Popular has with cars, home, and tractor sales.

Table 5: Reported active providers in supporting markets for brickmaking

Country	Technology providers	Finance providers
Bolivia	12	3
Brazil	30	5
Colombia	27	17
Ecuador	35	14
Mexico	33	4
Peru	16	4
Total	153	47

⁸ EELA also appears to have contributed to other positive social changes – for example reduction in child labour as a result of higher incomes – though evidence here is anecdotal.

Ideally, sustainability in the brickmaking sector would be supported by pressure from informed brick consumers, demanding better quality and price, and motivating producers to improve their 'offer'. In some cases this is happening – such as in Cusco where consumers expect cored (not solid) bricks – but in other areas less so. However, consumer pressure can be expected to build in the longer-term.

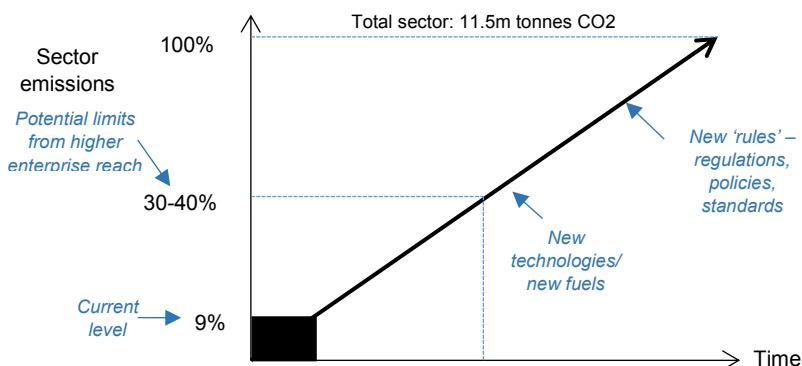
Will the market work better for more people? Thus far the market development facilitated by EELA appears to have had few 'losers'. With most construction sectors reasonably buoyant, brickmakers have been able to improve margins (and incomes) by introducing new processes, and there are no reports of employment reducing. However, as the sector develops, and becomes more productive and technologically-advanced, it can be expected that more competitive producers will emerge to take more market share and generate higher income for their owners – and higher remuneration for staff. In this context, some smaller producers are likely to be squeezed, with some closing and others pushed to the periphery of the informal household market. The final extent of closures here would be dependent on government action – especially legislation on business formalisation (such as in Colombia) – but overall employment would be likely to fall. This path of sector modernisation is generic, not being unique to brickmaking, and ultimately, as elsewhere, the 'winners' in this scenario would be consumers and the economy as a whole.

Is the market set for change that is 'transformative'? Although a much-used term in development circles, what does transformative mean in the context of the brickmaking sectors of Latin America?

Transformative change can be taken to mean a sector where a large proportion of producers perform at a significantly higher economic (related to for example productivity, quality, innovation) and environmental (such as GHGs) level, and where they have the incentives and capacity to continually improve their performance. A system that enables this transformative behaviour is one that is likely to be characterised by a range of factors and players, including: technology services and equipment providers that develop new, appropriate designs; organisations that undertake basic research and testing; financial providers that offer tailored services; forums and media for information exchange and networking; trusted standards on product quality; regulations (written and implemented) on environmental and social issues to incentivise change; and planning frameworks that provide security for longer-term investment.

In this context, the scale of the change that has been begun in each country is still relatively limited with a relatively small proportion of brickmakers have changed and then only to a very partial degree. If the challenge ultimately is to develop a carbon neutral industry, progress has been small. Of more importance than the level of change achieved thus far is to consider whether the conditions have been created to allow change to follow a transformative path. Figure 1 illustrates this point. In most countries, EELA's main impact has been to stimulate technology provision and use – and has been led by commercial, *market-push* factors. These can be powerful forces for change, especially when technologies are relatively simple, benefits are clear and economic and environmental goals are in harmony (such as with fans). But, in the characteristic clustered form of the brickmaking sector, change has not reached beyond a small number of clusters. Even if currently used technologies were to be adopted by most of the brickmaking sector, this would still 'only' likely achieve (approximately) 30-40% GHG reduction. To advance beyond current levels, where technologies are more difficult, expensive and riskier, increasingly change is likely to be shaped by the incentives provided by the actions of government, especially through regulation (*regulation-pull*) and technology support; ie the public policy space becomes increasingly important.

Figure 1: The sector changes – but is not 'transformed'



For EELA, only in Brazil and Colombia where more sophisticated technologies are being utilised and where the institutional structure is more developed has a brickmaking system developed that offers a path to major transformative change. In relation to public policy, this has mainly happened without significant influence from EELA. The key emissions law in Colombia for example was passed in 2008 and enacted in 2013. For other EELA countries, there has been little impact on the public policy 'rules' space. The most concerted effort to change the role of government around brickmaking has been in Bolivia through a range of activities including developing a sector policy, competency frameworks and a spatial planning tool. But, for reasons explored in section 3, these are unlikely to be successful. CCAC, as well as supporting direct training and some exchange initiatives, in principle also seeks to influence government policy. And unlike EELA, CCAC will continue in the future. However, CCAC has not played a significant role in shaping public policy as yet.

Overall therefore the picture is one of partial sustainability. Significant progress with regard to the technology part of the brickmaking market system but this undermined by lack of progress in the public policy space.

2.6 Summary of key findings with respect to the DAC criteria

From the above analysis, a number of key points emerge.

1. Although the process through which targets were developed remains slightly oblique, nonetheless, EELA overall has successfully reached its headline targets with respect to GHG reductions and cost savings from efficiency improvements.
2. It has done so with much greater overall efficiency than in Phase I, although in the Bolivia programme and in the functioning of the CO there remain concerns over efficiency.
3. EELA's success has been greatest in the development of an emerging technology services market – the programme's main focus and the key reasons for improvements in brickmaker performance.
4. It has also recorded some success in developing financial services for brickmakers though the constraints here have been less severe.
5. EELA has achieved comparatively little in its work to enhance public policies and the role of government, especially at a national level.
6. Overall, brick markets are functioning more efficiently as a result of EELA; the basis has been laid for a process of small-scale industrialisation leading to greater and 'greener' productivity growth.
7. Change has been driven by 'market-push' factors drawing on the commercial incentives of technology and finance suppliers and brickmakers – and this provides a basis for further sustainable change.
8. Change in the brickmaking sector has generally not been transformative – with producers performing at a significantly higher economic and environmental level. Two key reasons for this lie in the still relatively small outreach achieved – with reductions only amounting to 9% of sector GHG emissions and 11% of brickmakers reached - through 'market-push' factors and the lack of suitable 'regulation pull' pressures from public policy.

3. Performance through the market system lens

This section takes as its starting point the main headlines in EELA's performance highlighted in Section 2 and examines this in relation to some of the key principles of 'good practice' in the market systems approach. In doing so, the analysis identifies the underlying reasons – the why – for EELA's performance which form the basis of learning from the programme. Five good practice principles – framed as questions - are highlighted:

1. Objectives: Is the overall causal logic of EELA – and its priority - focused on systemic change?
2. Understanding systems: Is there a sufficiently detailed understanding and analysis of the brickmaking market system (s)?

3. Defining sustainable outcomes: Is there a realistic, detailed, and valid view of how the brickmaking system should function in the future?
4. Facilitating systemic change: Are the activities consistent with this view of the future and with recognised good practices?
5. Capacity: Is there appropriate programme capacity and organisation to effectively implement the approach?

3.1 Objectives

Is the overall causal logic of EELA – and its priority - focused on systemic change?

After the conclusion of the first phase, there was a recognition of the need to scale-up significantly in EELA Phase II which, in turn, brought a commitment to pursue a systems approach. This commitment was manifested for example in Phase II documents such as the ProDoc and Kreditantrag. Furthermore EELA highlighted three critical elements of systemic change – technology, finance and public policy – in the brickmaking sector and understood that genuine change would have to include these.

Systemic change was always seen as a means to the ‘higher’ impact goal of GHG reductions and cost savings from efficiency increases – with, in principle, no contradiction between the two. In practice, however, at times there appears to have been tension between these. In particular systemic objectives appear to have been subordinated. In part, this stems from the concrete tangibility of GHG reductions as an objective in comparison with the perceived ‘looseness’ of systemic change which, though it can be formulated as specific indicators, is less likely to be as concise or neat. For example, valid systemic indicators might be both qualitative – brickmaker awareness of new technologies, linkages between technology providers and technology researchers – and quantitative – number of technology transactions, number of investment-based loans. GHG reductions also has the advantage of being comparable across countries.

To some extent, this tension is inevitable. Neither is it necessarily a ‘bad thing’. It can be useful for programmes to have the discipline of a hard target to focus their efforts and it provides a convenient focus for both funder and implementer. The risk emerges when systemic change – which, more than headline targets *per se* is the key to longer-term development, is downplayed and is not given sufficient priority. This has occasionally happened with EELA and this has been manifested in what EELA has done. For example, in the relatively superficial level of depth shown in the initial market analysis (see below) undertaken at the start of the phase. And in later dilemmas faced by country teams as they considered their priorities – whether to ‘buy’ GHG short-term success by focusing on technology transactions (and, in the case of Bolivia, subsidising these) or pursue more difficult and less tangible longer-term systemic change goals. More generally, while the stated approach of the programme was about systemic change, its ethos and culture was more about GHG reductions.

Last in considering objectives is the question of systemic change for whom? As mentioned, having a dual objective of climate change and economic improvement is appropriate but it is also important to be aware of the potential conflicts between these. To some degree, EELA’s focus on artisanal brickmakers is a legacy of aid agencies’ emotional attachment to small-scale enterprises. In fact, a coldly rational perspective might suggest that if aggregate GHG reductions is what really matters, working to develop the system around large-scale enterprises – who dominate the sector - should be the priority. Indeed, to some degree, this is what has happened in Brazil where relatively larger (if not the largest) segment of enterprises was reached. Clearly, there is a balance that has to be struck here – but it is one that both donor and implementer should be open about so that the pros and cons of trade-offs are transparent.

3.2 Analysis

Is there a sufficiently detailed understanding and analysis of the brickmaking market system(s)?

Market systems approaches are analysis-led. What facilitators do in their interventions – and who they work with – should be guided by a detailed understanding of the constraints of the systems that they are seeking to change. Analysis therefore is not an academic distraction for a programme – it is

a critically important, inherent part of the intervention process. “Wrong” analysis can lead to “wrong” interventions. Nor is it a one-off activity, although a substantial analysis is required at the start, but a continuous process of learning as a programme proceeds.

At the start of EELA Phase II a market study was undertaken in each country. While this offered some useful insights and data it was deficient in a number of respects.

First, it was a generally static analysis that looked less at the dynamics of market interactions, and why transactions were/were not taking place. It focused on individual players and less on the market system as a whole – and did not make use of the market system frameworks in the analysis. As a consequence, the fresh recalibrating effect which the shift to a systems approach should have instigated did not materialise to any great extent. In Bolivia for example Phase II appears to have been seen as a continuation of Phase I with a few minor changes. The analysis missed important big questions. It failed to engage with – in any way – the dominant monopoly player in the sector who controls more than half the market. It failed to consider focusing on the region of with the biggest concentration of producers (Santa Cruz) which also had a reputation for innovation and enterprise and instead rather unquestioningly stayed in the regions in which it had previously worked (La Paz and Cochabamba).

One particular omission in this initial study relates to the clustered nature of the brickmaking industry. Knowing how brickmakers within clusters learn, from where they learn, and the relationships between clusters are central issues in considering intervention strategies that have the potential to scale-up beyond the limits of individual clusters

Second, there are some concerns over the accuracy of the analysis in finance. Clearly, it is relevant to consider finance as a key supporting market for brickmaking, and to understand the constraints to accessing finance for new investments. However, while many banks were relatively unfamiliar with the brickmaking sector, the analysis appears to have overestimated the extent to which there was a genuine finance constraint. In practice, the single most important investment for brickmakers has been fans – these are the ‘easiest’, lowest tech, lowest risk technology for brickmakers – the first rung in an investment ladder. Given the strong evidence of quick returns, banks have been generally willing to finance these. Or, if external finance has been unavailable, producers have shown considerable ingenuity in finding finance, including developing new collaborative business models – fan rental, fan sharing, subcontract firing services – that reduce finance needs.

If the broad benefits of the PEFAT process – injecting more ‘hard’ data into EELA staff understanding of brickmaking as a business – are clear, it is less evident that there was a need for a specific tool for banks to use in assessing the credit worthiness of brickmaking investments (which was one PEFAT’s main goals). If there was a need for this detailed tool, the analysis should have identified financial provider capacity – their lack of specific analytical tools and data appropriate for the brickmaking sector – as a key constraint. Yet, since only banks in Brazil are known to have used PEFAT as a tool, with all others adapting their own internal loan appraisal systems, the utility of PEFAT for this purpose has been limited. Some banks do comment favourably on the broader benefit of seeing brickmaking in a more business-like way after PEFAT but it is questionable if this in itself merited investment in developing such a complex tool, especially one that is focused on kilns which have not been a common brickmaker investment. A more detailed analysis of financial services for the brick sector would have helped to shape a more appropriate intervention.

Third, as alluded to before, there may always be a slightly arbitrary aspect to determining targets in a market systems programme – and these should be revised as programmes proceed and learn through intervention. However, in the case of the targets developed for both technology services and financial institutions these do not appear to have been shaped by initial market analysis.

Fourth, the position of public policy in EELA has been anomalous from the outset. This is shown in EELA’s own documentation which, while recognising the importance of public policy, does not see it as a process or a system. The ProDoc and Kreditantrag highlight the importance of influencing public policy but failed to identify the implications for EELA. An initial results chain on public policy was later dropped. Discussions with EELA staff confirmed this view of public policy as ‘different’.

By not seeing public policy through the same systemic lens as other spheres, it was placed in a

different light from interventions in finance and technology. While here the aim is to ‘make the system work’ so that financial and technology services can continue to develop beyond EELA – for public policy no such goal exists. However, wider experience in international development recognises that it is counterproductive for aid interventions to intervene directly to influence policy/regulations without recognising the system around them. And, like any market system, this can be seen as having a ‘supply-side’ (government) and a ‘demand-side’ (the sector), with different players driven by different incentives. Here, however, many incentives are more political in nature than commercial. Similarly, like any market system, there are supporting functions and rules with information important in shaping decision-making and the informal norms as important as formal rules. (Annex 4 expands on these points).

Why was it a problem for EELA that its analysis did not see public policy through a systems lens? For a number of reasons:

- In Bolivia, it allowed a mismatch between interventions and constraints. A considerable part of EELA’s programme here in its last 18 months became focused on seeking to improve the functioning of the Bolivian public sector with respect to brickmaking. The underlying assumption here was that the problem to be addressed was essentially technical in nature – a matter of providing resources (policies, manuals, standards) to fix a ‘we don’t know how to change’ problem. In fact the real nature of the problem was related to political incentives – a ‘we don’t want to change’ problem. This mismatch means that interventions have not been successful.
- It allowed a generally optimistic assessment of government capacity to prevail. In fact, the nature of brickmaking as a geographically-specific extractive-based economic activity with potentially major environmental impacts, means that the government structures relevant to it are complex, with for example, national ministries dealing with the economy, the environment and mining and local government dealing with land use, planning and pollution issues all being relevant. Influencing such a complex weave of different departments and interests is a challenging task. This is particularly the case in resource-poor environments where government capacity is weak.
- It forced interventions all to follow a supply-side path – engaging with government directly – and neglected the potential of working elsewhere in the system, for example, raising awareness among decision-makers and other stakeholders of brickmaker issues through specific research.
- It allowed country programmes to proceed without considering consciously the question: is it feasible for us to intervene in public policy? In a market systems approach, where to intervene in a system is shaped first by analysis of where the key constraints lie and second by a candid assessment of the likelihood of success. This often means that intervention is pursuing ‘second-best’ priorities but there is simply no point in pouring resources into impossible tasks⁹. Second-best can still be valid.

3.3 Sustainable outcomes

Is there a realistic, detailed, and valid view of how the brickmaking system should function in the future?

Market systems approaches require a sufficiently detailed market analysis to inform facilitators of the existing situation – to gain a picture of ‘where we are’. More than this, however, they need to have a sense of ‘where they are going’. This means having a future picture of how a market system – or parts of it – should work at the end of a programme, of, among key system actors (public and private) ‘who will do’ and ‘who will pay’ for key functions. Without this, there is a danger that programme activities drift into delivering now but neglect how future delivery will be undertaken.

In this sense, neither EELA as a whole nor any of the country programmes have developed explicitly a view of how they envisage the brick market functioning at the end of the programme period! Implicitly however there is, de facto, a vision for the technology and financial services for the brickmaking sector. The essence of this is that commercial incentives will continue to drive the

⁹ One of the most influential market systems projects – Katalyst in Bangladesh (also funded by SDC and implemented by Swisscontact) – for many years did not engage with government on policy issues simply because it deemed it highly unlikely that it would be successful.

market. Providers will innovate and seek new clients because it is in their commercial interests to do so, and have the technical know-how and relationships to develop new designs and solutions. Brickmakers, having witnessed the commercial benefits of technological investment (typically fans), are keen to explore ways of further improving performance.

This is a plausible, realistic view and, as already stated, efficiency improving technology adoption by brickmakers can be expected to continue. However, there are three problems with it, both of which might have been addressed if a more formal attempt to develop a future vision had been developed. First, there is a 'who'll do what we do' problem. EELA has played a catalytic role in developing the technology services market in particular, which has involved typically, supporting: exchange visits to expose providers to new ideas and contacts, technical development of new designs – sometimes on a very light touch basis (drawings) and sometimes with more direct advice – and demonstration pilots with brickmakers. If these activities are required in the future to further develop the market, who will do them? Or are they seen as 'one-off' interventions which will be absorbed into the activities of existing players?

Second, implicit within this picture is a simplistic, linear view of how markets develop, an assumption that producers move on logically and smoothly from fans to extruders to new kilns etc, with change, in all probability, led by Brazilian (and perhaps Colombian) technology providers. However, this view ignores the important role of 'disruptive innovation' in stimulating market change caused by, for example, changes in rules/regulations or the emergence of a radical new technology. Governments often play a role in creating the conditions for innovations of this type – such as significant moves towards biomass fuels and a carbon-neutral industry. This kind of change therefore doesn't just happen – it often requires a more active role by government and better links between research organisations and technology providers, and this complicates any view of the future. Of course in relation to technology, in practice, some of these connections were explored by country programmes – for example the involvement of a technical university in Bolivia.

Third, it is not clear if this view deals with the clustered nature of the industry, and especially the position of less advanced clusters where capacities are weaker. Through what mechanism is it envisaged that these producers might be included within the market development process?

To sum up, the point about making a view of the future explicit is that it provides a discipline to guide interventions and raises a programme's ambitions – without this programmes can slip into a slightly naïve hopefulness. The absence of a future vision from undermined the programme's ability to achieve a more sustainable impact.

Ideally of course, it is stakeholders within an industry who develop a future vision for it – and which a programme such as EELA could support. Indeed, in Colombia EELA's implementation partner CAEM is playing an active role (with government) in developing a future vision of the sector.

3.4 Systemic change action

Are facilitation activities consistent with this view of the future and with recognised good practices?

Led by analysis and in pursuit of a future vision, interventions in market systems approaches should be guided by a number of 'good practice' principles that have emerged over the course of many years of experience and learning. These include the need:

- For interventions to be 'right-sized' – appropriate for the partner and activity;
- For relationships to be transactional – based on a quid pro quo that builds on the incentives of partners and develops their ownership of change
- To work with appropriate players who are positioned to influence the development of the system
- For pilots/demonstration to be clear about their intended outcomes and how these contribute to crowding-in.

EELA's intervention activities in each country differ but typically include: exchange visits, information provision, technical assistance to develop technologies, training, market studies, coordination meetings, direct support for demonstration projects, and subsidies for technology transactions. How then does the EELA experience compare with guidelines on facilitation? Several points stand out.

1. Exchange visits as a pivotal starting point

Exchange visits involving brickmakers and technology providers were often the key to developing the technology services market. These frequently opened people's eyes to the nature and potential benefits of change, introduced them to potential change partners and created the awareness then understanding that are prerequisites to changing behaviour. For a number of reasons, these visits, although often a part of development projects, appear to have been particularly effective here.

- They were focused tightly and practically on common factors facing brickmaking – although there are differences between countries there is also a large degree of homogeneity.
- They built on the nascent reality of a regional market in brickmaking technology, led by more technically advanced Brazil and Colombia. Providers therefore were looking for opportunities.
- They were well-researched, with the regional structure of EELA ensuring that the right people and businesses were present
- They tested the commitment of participants by requiring that they contributed – travel or accommodation/subsistence costs typically – to funding the costs of the exchange.
- They built on a good understanding of the key constraint – incentives. With wider evidence that within the region there is sufficient supply-side skills and capacity (the how to), the challenge to be addressed was improving information to address the incentives (why?) constraint.

2. Right-sizing technologies

EELA's initial emphasis (in Phase I) was on introducing improved kilns. Kilns however are a substantial investment (typically \$10-30,000 but up to \$2m for very advanced technology) requiring external finance, with relatively long and risky paybacks. Fans, on the other hand, are cheaper (\$500-2000), with a short payback period, can be shared or rented, are low-risk, and, even if external finance is required, is likely to be made available. For producers, fans are a logical 'first' investment. EELA's emerging focus on these aligned it with producer incentives and right-sized its support.

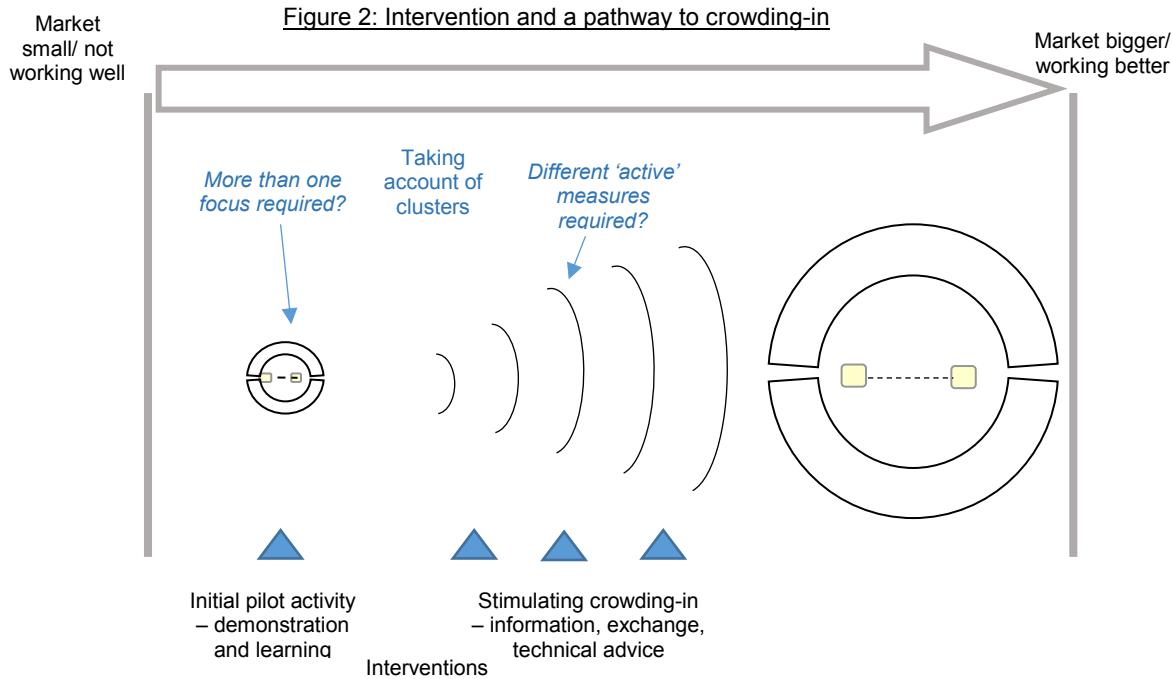
3. The distortional risks of direct support for transactions

From the outset in Phase II the Bolivia programme decided to provide a subsidy to promote fan purchase. This was given directly to brickmakers and amounted to up to 50% of the purchase price. With the arrival of new team leader and concerned about the potential distorting influence of such overt transaction subsidies, there was an immediate decision to reduce the size of this subsidy and direct it to technology providers as an incentive 'bonus' for sales rather than brickmakers. However, to some degree this was an exercise in damage-limitation. While there is no evidence to suggest that fans are any less affordable to brickmakers in Bolivia than elsewhere, the subsidy mentality appears to be strongest there. The reason why subsidy was given in the first instance are not clear, although the Bolivia programme's relative surfeit of funds is likely to have been an important factor and direct subsidy is an 'easy' (if lazy) form of intervention. In other words, this intervention was funding-pushed not analysis-led.

Nearly all of the fan purchases reported in Bolivia have been subsidised by EELA – only in the last few months of the programme has unsubsidised crowding-in (new providers) been reported. Fans take up in Bolivia has been slower than elsewhere.

4. From initial pilot to crowding-in

The general model of support from EELA for technology development and adoption – though with some variations – fits well within the 'common' model in market systems approaches (Figure 2). Initial, relatively intensive support in the form of information, technical assistance and demonstration project development makes way for lighter support – such as information and exchange visits – to encourage both more purchases and other providers to enter the market.



Box 3: Agreements to encourage crowding-in

A strategic agreement between EELA Bolivia and Sandro Cespedes outlined how technology transfer works in practice. Although EELA financed 1/8th of the cost of the new kiln, which is the first of its kind in Bolivia, Mr. Cespedes is required – as a stated clause in the agreement - to allow his kiln to be used for demonstration firings and exchange visits from other gypsum producers, thus facilitating, rather than restricting crowding-in of other brick producers.

In hindsight fans turned has turned out to be a relatively 'easy' market – the scale of almost-guaranteed returns making it a very low risk investment – but the model of intervention holds for other technologies too (Box 3).

The geographically clustered nature of brickmaking, however, may pose a challenge to this model of system development. For example, it may be necessary to have more than one area of focus for pilot activities. Or more active interventions may be required for more difficult clusters that are not as receptive to 'light touch' prompting.

5. Demonstration getting the message right

EELA recognised at an early stage that for brickmakers no amount of information or presentation could substitute for the visual persuasiveness of a 'real-life' demonstration. For brickmakers, seeing is believing, and practical demonstrations are a key element in stimulating interest and buy-in. However, for this to work, facilitators have to carefully consider the message they are 'selling'.

Peru has witnessed examples of sending the right (Box 4) and the wrong message. Phase I was comprised of relatively intensive direct support in San Jeronimo designed to demonstrate to other clusters of brickmakers the benefits of changing practice and investing in new technologies. While this has been successful with some brickmakers it is noticeable that in the cluster closest to San Jeronimo (Pinipampa), it generally hasn't. Take up here has been minimal – the lesson of San Jeronimo they

Box 4: Demonstration to stimulate (and not distort)

EELA Peru demonstrated thoughtful and clever approaches to introducing fans in San Jeronimo. As the technology was new and scepticism was high, instead of trying to encourage producer adoption through direct and potentially distortionary cost-sharing, the programme purchased and lent three fans to the Association of Brickmakers in San Jeronimo.

Several months later, once producers had had the opportunity to try the fans and experience the cost savings benefits themselves-at very low risk to their operations - EELA removed the fans. Now convinced of the benefits themselves, deciding to invest –at full cost - became a much easier decision for the brickmakers.

feel is not that success comes from investing in new technologies but rather it comes from having intensive direct support from a foreign-funded aid project.

Box 5: A 'good' product but owned by no one

The uncertainty many brickmakers face as cities grow and their production areas clash with residential areas is common throughout the region. Spatial planning was thus correctly identified by EELA Bolivia as a constraint to investment by brickmakers. The root of the problem is as much political (ultimately brickmaking doesn't matter enough to decision-makers) as technical. However, this political analysis was lacking as the programme embarked on technical product development; a very high quality spatial planning manual. This was conceived, led and resourced by EELA - but had no institutional ownership.

The Ministry of Planning - the government organization legally responsible for such issues - has an existing, albeit outdated, manual, but was not interested in leading the dissemination of a revised manual. Nor, as it knocked on many other doors, were any other government departments. The manual has no institutional home; a technical solution was being provided for, ultimately, a political problem.

6. Partners that reflect systemic ambitions

While Phase I was primarily concerned with working directly with brickmakers, in Phase II EELA has broadened its range of partners to embrace a wider spectrum of the market system – such as technology service providers, banks, government and the media. This is appropriate and fits with well a programme pursuing a more systemic approach.

7. Ownership and incentives – the mixed public and private sector experience

Central to EELA's success in building the technology services market has been recognition of the incentives of private sector partners and an intervention process ("they get nothing for nothing") that ensured their ownership of the intervention output (new technologies). However, these same principles have often not been followed when it comes to interventions with the public sector. In Bolivia EELA has for example played the lead role in developing (1) a draft national policy for the brickmaking sector, (2) plans for a Sector Platform to help coordinate the sector, and (3) a competency framework for brickmakers. In none of these cases is there any evidence that government (in different Ministries) has strong organisational or political interest in making these initiatives work post-EELA or was the intervention process designed to require government input and ownership. Coupled with a very limited timeframe within which to act, with the programme only really engaging in policy work halfway through its 3-year term, interventions were, classically, *donor-pushed*. EELA did and paid for most of the main tasks. It is the team's view that in these cases – and others (Box 5) - there is little likelihood of progress beyond the life of EELA.

8. Getting at public policy indirectly

EELA's attempts at facilitating change in government directly have brought minimal success. However, there have been some minor examples of positive change from government at a local level, where municipalities have developed rules on for example burning and use of fans, in response to changes taking place among brickmakers (which themselves have been catalysed by EELA (Box 6). It might be argued that it is easier to bring influence to bear in this way to local governments because brickmaking is often an inescapable issue for them and political concerns are weaker. But the same principle may have application at a national level. Influencing government directly, as foreign-funded entity, may be difficult or inappropriate and it is not likely that 'supply-side' support will be successful. However, change can be supported indirectly – for example through relevant topical research with a local partner or advocacy group – which may open up government to reform of regulations or of its role.

Box 6: Local government restrictions supporting technology change

A large percentage of brickmakers in Sacaba, Bolivia, were convinced of the utility of fans to reduce their fuel costs after EELA Bolivia conducted several demonstration burns and exchange visits. As wood inputs fell from three trucks to two trucks with the use of fans, the benefits were obvious. However, not all producers in the area chose to adopt fans, continuing to emit smoke while firing and contribute to social problems in the Sacaba.

The local government decided to create a municipal ordinance required the use of fans in all brick production as a condition for temporary permission to remain in their current location. This regulatory "stick", supporting an emerging trend, served to push the laggards into adopting cleaner technology, too.

3.5 Capacity

Is there appropriate programme capacity and organisation to effectively implement the approach?

The market systems approach represents a challenge to development organisations relative to conventional direct delivery. Playing a role as a facilitator is more difficult and requires adaptation with respect to organisation, skills and knowledge, and resources. How has EELA's own organisation and capacity responded to meet this challenge?

From an organisational perspective, overall, the regional structure of EELA has been successful. This fits with the regional nature of the brickmaking technology market and has allowed synergies in programme operations. EELA has achieved more as a regional programme than it would if it was structured as six separate country-based programmes. The CO's role was particularly important in supporting inter-country exchange and in developing country teams understanding of the approach, some of whom found it very different and revelatory. The CO's role in shifting the programme's geographic focus in Mexico – before which the programme was struggling - was also important.

Against this, in a number respects the CO was less successful. Its role in managing information and knowledge and ensuring better economies of scale in learning – a key rational for the regional structure – could have been improved. The MONELA monitoring system primarily serves an external accountability function to SDC – it offers little value to country management (who often have their 'own' monitoring information). There are also contradictions and doubts over the reliability of data. It is also not clear what value is to be gained from the endline evaluation but it is clear that there was a weakness at the outset of the phase in the depth and coverage of the initial market studies.

The other side of the regional structure from the CO has been the implementation organisations in each country. Three of these were local organisations and three Swisscontact. The experience with the three local organisations has generally been positive. These have been in the three highest income, most developed countries which have together contributed most to the programme's overall goals. Indeed, one advantage of working with them is that they – especially in Colombia and Brazil – have a mandate to continue working within the sector. So although the programme's activities will end, some of the key functions – information, coordination, advocacy – that are essential for sustainability are more likely to continue. Arguably in the other, institutionally weaker countries where Swisscontact was leading, this kind of institutional development should have been a stronger priority.

The situation of Bolivia requires specific comment. Funded separately by SDC Bolivia – and with many more resources than other countries – the CO appears to have rather left it to itself and not engaged actively with it. Yet there were two points at which, strategically, the Bolivia programme lost its way: initially in providing large subsidies for technology transactions directly and second, having identified (correctly) the multiple systemic problems with government and regulations, been overly-optimistic (or naïve) in its assessment of what could be achieved here through intervention. At both of these points the CO should have been able to play a guiding 'sounding board' role, but this didn't happen.

In terms of skills and knowledge, there is a variable but generally positive picture, especially at a country level where personnel have sought to take ownership over the approach. In some cases, EELA's work has been undermined by lack of capacity; in others the knowledge, credibility and relationships developed have been central to success¹⁰.

Last, in relation to resources, the review team's observation is:

- proportionally, too many resources were allocated to the CO (see the earlier discussion on efficiency and PEFAT),
- too many resources went to Bolivia – a more limited budget here may have forced better decision-making; and

¹⁰ In both Mexico and Peru EELA personnel are likely to be engaged, commercially, by private sector firms after the programme finishes; a strong endorsement of the role they have played.

- not enough was made available for on-the-ground facilitation. Although in aggregate EELA is successful, especially given the clustered nature of the industry, more could have been achieved with a modest increase in resources.

4. Conclusions

This section (and Section 5 which follows) provides a summary of the main conclusions from the review by responding to the specific questions raised in the terms of reference:

1. To what extent can a specific (net) impact be attributed to the programme?
2. Did the programme make a difference?
3. How has the programme made a difference?
4. Will the programme work elsewhere?

The last of these questions which encapsulates the forward-looking, learning agenda from the programme is dealt with in Section 5.

4.1 Can a specific (net) impact be attributed to the intervention?

Assessing net attribution in depth requires a control group to provide a valid point of reference, suitable baseline data, and use of methodologies such as quasi-experimental methods, all of which are beyond the scope of this review. However, even if on a more impressionistic basis, it is possible to derive an informed and accurate view of attribution.

Overall, it is likely that a proportion – much less than half - of the headline GHG reductions would have happened in the absence of EELA. For example, the institutional structures in Colombia and Brazil, though assisted by the programme, are functional and effective while even in other less advanced environments – such as Puebla in Mexico – technological innovation was beginning to happen without EELA.

But against this, because market players have the capacity and incentives to do so, further investment and development can be expected, which will further add to the current headline GHG impacts.

4.2 Did the programme make a difference?

The programme made a positive difference in two related ways.

First, it accelerated processes that were at a nascent stage of development, tapping into incentives for change, chiefly related to the introduction of emerging technologies.

Second, it instigated awareness, understanding and eventually changed behaviour that would otherwise not have happened, or not happened for the foreseeable future. The programme played a catalytic role in stimulating and supporting systemic change.

Overall, the programme has met its headline GHG targets – fifteen times the level achieved in the pilot Phase I and 8% of the total emissions from sector.

4.3 How has the programme made a difference?

The programme has succeeded primarily by supporting the development of the technology services market for brickmakers. It has done so through a series of complementary interventions based around relationship building with key players – technology and finance providers and brickmakers – to make the sector more visible, experience exchange, information provision, technical assistance for demonstrations, limited initial financial support (especially for more expensive technologies such as kilns), and hand-holding for scale-up. Given the different incentives and capacities in place, further development of this market can be expected.

Overall, the programme has made good use of its regional structure to tap into the dynamics of what is a regional market. It has been relatively successful in interpreting and applying the market systems approach to the technology services market.

The programme has had least success in influencing the public policy environment around brickmaking. Engaging with national governments directly in particular has not brought significant

results. The organisational and political incentives shaping behaviour in government make this a challenging environment. However, the programme's work here has been hampered by not viewing public policy through the same systems lens as its other work.

On the basis of these changes further reductions in GHG and improvement in brickmaker productivity can be expected. For change to be genuinely transformative however, more advanced technologies will be required which in turn will require more enabling regulations from government. While both Colombia and Brazil, with stronger industry and government institutions, are proceeding on this path, other countries are unlikely to do so without change in the public policy space.

5. Key lessons learned

With regard to wider learning – and a future agenda – emerging from the EELA experience, four overall points should be noted.

5.1First

The systems approach is supported by EELA's experience.

Strategically, the decision to adopt a systems approach in Phase II has allowed EELA to achieve its objectives. The approach has particular relevance because of its ambition and potential to achieve impact at scale and sustainability, and because it can be applied to programme's pursuing multi-disciplinary goals such as those related both to the environment and to economic development.

But, to be successful, programmes adopting the approach need to operationalise it and adhere to the operational good practice/lessons from wider experience gathered over last 15 years. Successful application of the approach doesn't just happen – it has to be created and managed. There are a number of important implications:

- Putting systemic change objectives at the heart of programme operations
- Giving appropriate priority to market systems analysis as a critical starting point in understanding constraints and potential intervention points
- Developing a future vision of how sectors can function better and sustainably to provide strategic direction for interventions
- Ensuring that facilitation practices follow recognised good practices related to, for example, ownership, incentives and relationships
- Developing the information and knowledge base to guide management decision-making
- Building the skills and knowledge of staff in the approach.

5.2Second

A regional programme structure is supported by EELA's experience.

Strategically, the organisational form of a regional structure for EELA has been critical to its success, for two main reasons: the regional programme structure (1) is consistent with the regional reality of the market system and (2) allows for synergies between countries (for example in exchange interventions) and for economies of scale in operations in relation to learning and reporting.

But, to be successful, programmes adopting a regional structure, need to:

- Ensure there is a valid, common regional link, such as a market, connecting different country players
- Develop a strong information and knowledge base
- Have an active approach to learning and staff development

- Have clarity over the functions and role of a coordination office
- Have a transparent means of allocating costs to different budget lines including country programmes
- Select partners who are able to engage with key players in a sector

5.3 Third

Programmes should balance realism and ambition in engaging on public policy.

While commercially-driven ‘market-push’ change is central to the development of market systems, for change to be transformative, the lesson from brickmaking is that this needs to be accompanied by change in the public policy/rules space – ‘regulation-pull’ change. In brickmaking this relates to fundamental issues such as emissions, fuels, technologies and land.

But while public policy is important, there is no easy panacea to facilitating change here – indeed the opposite. The greatest chance of success, as in other spheres of intervention, lies in considering public policy through a systems lens, allowing this to guide actions (see Annex 4). Future work in this, and similar domains where there is an ambition to push the frontier of green technologies use, should take a systems approach to public policy work. However, this needs to be tempered by realistic consideration of the feasibility of intervening successfully.

Fourth, finally, and an overarching point embracing the above three broad messages, for the EELA experience to be a useful source of learning – or replication – for other programmes, it is vital that the lessons from it are fully exploited. Again, this will not simply happen by itself.

This review has thrown some light on EELA. It indicates that the experience has strong relevance, particularly for programmes related to the environment. But this review in itself is unlikely to be enough. If SDC and the wider development community, including funders and implementers, are to benefit properly from EELA’s experience, especially Phase II, an independent, detailed learning case study should be undertaken, focused not just on EELA’s achievements but, critically, on how EELA has operated. Without this there is danger that the real value of EELA is not achieved, for SDC and for the wider development community.

Annex 1: Terms of Reference

Final External Review

Energy Efficiency Programme for Brick Kilns in Latin America to Mitigate Climate Change (EELA)

CONSULTANCY ASSIGNMENT:

Programme Title: EELA
Countries: Argentina, Bolivia, Brazil, Colombia, Ecuador, Mexico, Peru
Organisation: SDC
Duration of Review: Period September – December 2016

I. Background and Introduction

From 2004 to 2009, Swiss Development Cooperation (SDC) funded the Regional Clean Air Programme (PRAL for its initials in Spanish). The programme had major success, reducing Greenhouse Gases (GHG) emissions by 30 per cent through improved energy efficiency in brick kilns of small artisanal brick producers and by fostering South – South knowledge exchange between Peru, Mexico and Bolivia.

On the basis of this experience, SDC went ahead with its work in this field through the Energy Efficiency Programme for Brick Kilns in Latin America to Mitigate Climate Change (EELA) with the objective of reducing GHG emissions by means of technology change, while at the same time improving producers' income through the mass application of new technologies and use of best practice in artisanal brick-making that improve energy efficiency.

In EELA Phase I (2010-2013), 270 artisanal brick factories in the seven countries implemented at least one technology change, reducing GHG emissions by at least 30 per cent and increasing income by 10 per cent. Some 73 brick factories adopted the comprehensive energy efficiency model. The project promoted regional exchange between stakeholders and beneficiaries with face-to-face courses and virtual platforms and validated intervention models, paving the way for systemic intervention in Phase II.

EELA Phase II (2013-2016) is focused on promoting market systems to scale up the implementation of validated best practice for energy-efficient production. EELA is contributing to **the reduction of GHG** emissions through technological changes that improve energy efficiency and thereby also **increase producers' incomes**. This phase is active in Argentina (much less intensive), Bolivia, Brazil, Ecuador, Colombia, Mexico and Peru, and has pursued four main expected outcomes: 1) dissemination of alternative technologies and innovative and efficient products through a local and regional market approach; 2) impact on public policies that promote the mitigation of GHG in the brick industry in partnership with the Climate and Clean Air Coalition (CCAC) and in the gypsum sectors; 3) promotion and strengthening of sustainable development (energy use, land use and health) in the brick - and gypsum sector in Bolivia - as an experience which can be disseminated in other countries; and 4) promotion of South-South knowledge exchange.

The EELA approach is guided by the four underlying principles of the systemic approach (M4P) intervention: 1) focusing on systemic action: understanding where market systems are failing to serve the needs of the poor, and acting to correct market failures; 2) seeking sustainable change from the outset: delivering sustainable outcomes by better aligning key market functions and players with the incentives and capacity to work more effectively; 3) pursuing large-scale impact: targeting intervention that benefits large numbers of poor people; and 4) acting as facilitator: giving development a role as catalyst, one which stimulates, but does not replace, market functions or players.

There are three main groups of stakeholders or “market actors” for this phase of EELA: technology providers, financial institutions and public entities.

The EELA Programme also worked with the CCAC and public institutions that promote energy efficiency, good environmental performance and/or microenterprise development. Additionally, public entities supported the programme in areas such as formalisation, product quality control, legalisation of land, emission norms, etc.

For SDC, investing in this programme means investing in climate and development, as this intervention strives to ensure an increased income for the artisanal brick producers and the reduction of GHG emissions, contributing to the international climate commitments under the United Nations Framework Convention on Climate Change (UNFCCC).

After seven years of implementing EELA (2010-2013 Phase 1 and 2013-2016 Phase II), SDC is conducting an independent review in order to gain insights and to have a better understanding of its relevance, efficiency, impact and sustainability.

II. Objective

This final external programme review will assess the consolidation strategy of the EELA Phase II through a systemic approach, South-South policy influencing and sector-to-sector exchange. It should make a critical assessment of the extent to which the objective/outputs/activities have been achieved against the results and resources framework, and help to identify factors that have facilitated or hindered the success of the project.

III. Scope of the review

This independent review of the EELA Programme will focus on Phase II (2013-2016). It is expected to be conducted between September and November 2016.

SDC suggests that evaluators focus on four questions:

- To what extent can a specific (net) impact be attributed to the intervention?
- Did the intervention make a difference?
- How has the intervention made a difference?
- Will the intervention work elsewhere?

The following issues have to be considered:

- Systemic changes: indicators of changes in the underlying causes of market system performance that lead to a more effective, sustainable and inclusive market system for energy efficient innovations in the brick sector.
- International and national public policies: the analysis will focus on the EELA project's contribution to policy influencing and advocacy - as follows:
 - Framing debates and getting issues onto the political agenda: this is about attitudinal change, drawing attention to new issues and affecting the awareness, attitudes or perceptions of key stakeholders.
 - Encouraging discursive commitments from state and other policy actors: affecting language and rhetoric is important for promoting the recognition of specific groups for example, or endorsing international declarations.
 - Securing procedural change at domestic level: changes in the process whereby policy decisions are made, such as opening new forums for policy dialogue.
 - Affecting policy content: while legislative change is not the sum total of policy change, it is an important element.
 - Influencing behaviour change in key actors: policy change requires changes in behaviour and implementation at various levels in order to be meaningful and sustainable.

- Knowledge generation and exchange

IV. Criteria for the review

The External Review should apply the five review criteria proposed by the OECD-DAC (www.oecd.org), adapted to the context of EELA, responding (at least) to the following points:

1. Relevance: analysis for each country component and for the overall programme.

- 1.1 Relevance of the programme goals and objectives: to what extent do the goals and objectives of the programme remain valid?
- 1.2 Is the market approach relevant for the achievement of the programme goals?
- 1.3 Are the chosen country-implementing partners relevant in the development of the national results chains and for the achievement of the programme goals?
- 1.4 Are the activities, outputs and the results chains of the programme consistent with the objectives and the attainment of programme goals?
- 1.5 Are the activities, outputs and the results chains of the programme consistent with the intended impacts and effects?
- 1.6 In the spheres of intervention, are the activities, outputs, results chains and goals of EELA Phase II consistent with the national or sub national policies of the industrial and/or air quality and/or forest?
- 1.7 Relevance of the monitoring system developed for the EELA Phase II

2. Effectiveness: analysis for each country component (considering also the national circumstances) and for the overall programme.

- 2.1 To what extent have the objectives and programme goals been achieved?
- 2.2 What were the major factors influencing the achievement or non-achievement of the objectives and programme goals in each country?
- 2.3 Effectiveness of systemic approach (M4P) and country strategies applied by the EELA Programme
- 2.4 Effectiveness in the introduction and consolidation of the results chains.
- 2.5 Effectiveness in the South-South knowledge exchange and dissemination as well as sector-to-sector knowledge transfer
- 2.6 Special review of the indicators used (suitability, effectiveness, measurability)

3. Efficiency: analysis for each country component and for the overall programme.

- 3.1 Were programme interventions cost-efficient?
- 3.2 Were the programme goals achieved on time?
- 3.3 Was the programme implemented in the most efficient way compared to the phase plan?
- 3.4 Were the country markets efficiently stimulated to cover their gaps?
- 3.5 Was the EELA monitoring system (MONELA) efficient and replicable (for example in the NAMA process)?

4. Impact of EELA: analysis for each country component (considering also the national circumstances) and for the overall programme.

- 4.1 Developed capacities of stakeholders and partners promoted by the programme in each country
- 4.2 Importance/relevance of climate change mitigation and increased income for brick producers in each country
- 4.3 Importance/relevance of climate change mitigation and reduction of air pollutants for decision makers (What real difference has the activity made for the beneficiaries?)
- 4.4 Usefulness of EELA tools and outputs for the private and public sector in each country
- 4.5 Improved activities of climate change mitigation and increased income (quality and improvement of the type of activities)
- 4.6 Estimate of the quantity of beneficiaries and benefits of EELA Phase II

- 4.7 Feedback from EELA stakeholders' participants of the result chains
- 4.8 Impact and contribution of EELA on public policy in each country where activities are held
- 4.9 Identification of cross-cutting themes addressed by EELA including climate change policy, clean air policy, regulatory framework and innovation

5. Sustainability: analysis of each country component (considering also the national circumstances) and of the overall programme.

- 5.1 Are the country brick markets working more efficiently than at the start of the programme?
- 5.2 After the EELA programme intervention, is the brick market working sustainably and with less failures in each country?
- 5.3 Will the brick market operate effectively for everyone in each country after the EELA programme completion?
- 5.4 Sustainability of effects or changes promoted by the programme in the country components.
- 5.5 To what extent would the benefits of the programme continue in each country component after donor funding ceases?
- 5.6 Identification of stakeholders who will continue with EELA market promotion activities after programme completion
- 5.7 What were the major factors which influenced the achievement or non-achievement of sustainability of EELA in each country?
- 5.8 Analyse the perspective of the brick sector into the in the CCAC

V. Methodology

The consultant team should undertake to review along the following four main steps:

1. **Document review:**
The consultant team should conduct a desk review (home-based) of both programme phases, including the Annual Operational Plans, Impact Chains, Annual & Semi Annual Reports, Steering Committee Minutes, Mission Reports, Technical Studies, Publications, Press Notes and Audit Reports and contextual information regarding the countries of intervention;
2. **Interviews:**
Skype discussions with stakeholders in each country in EELA's scope: Argentina, Bolivia, Brazil, Colombia, Ecuador, Mexico and Peru; and with key international stakeholders, such as member from the CCAC.
3. **Field visits:**
The independent review includes field visits and face-to-face conversations with relevant stakeholders referred to impact chains subjects (as for example country implementers, beneficiaries, local or national authorities) in **three** countries where EELA has held activities.
4. **Follow-up:**
Enquiries by phone/email/Skype and elaboration of final products (home-based), which involves interaction with SDC (Lima and Switzerland) and Swisscontact.

Methodology:

- Before the field missions, the consultant team should coordinate closely with the officer responsible for EELA at Swisscontact and respective SDC officers in order to schedule mission appointments.
- All documents including the Phase Programme, Annual Operational Plans, Impact Chains, Annual & Semi Annual Reports, Steering Committee Minutes, Mission Reports, Technical Studies, Publications, Press Notes and Audit Reports should be provided by SDC and Swisscontact.

- At the request of the consultant team, Swisscontact will provide the stakeholder contact information for the interviews by phone, Skype or in the field. Likewise, Swisscontact should help the consultant team arrange field visits.

VI. Requested Deliverables

1. **Work Plan**, taking the proposed timeline below as a reference, background information, goals and objectives, resources and constraints, methodology and activities, milestones, risks and detailed budget.
2. **1st Draft of EELA Review Report** Phase II
3. **Review Report** of EELA Phase II (no more than . 20p Arial 10 + annexes.), The Report has to include a specific section with an analysis of promising practices for scaling-up/replication and key lessons learned.
4. **Communication Documents**, summary of key findings (ex. info graphics depicting results and impacts of the programme).

VII. Period of Consultancy and Proposed Timeline

The consultancy should take place between September 2016 and January 2017, and is mandated by SDC's Global Programme on Climate Change. Field visits, interviews, and meetings will be arranged after prior coordination with Swisscontact and SDC responsibles in Lima, La Paz and Switzerland.

Date *	Milestone
28.09.2016	Start of Consultancy
06.10.2016	Work Plan submitted
13.11.2016	1st Draft Review Report of EELA
04.12.2016	Review Report of EELA completed
10.01.2017	Communication Material completed
01.02.2017	Video conference or presentation of results and conclusions of review process: review report, recommendations and submission of finalized communication material.

*Adjusted to the real dates

VIII. Consultant Team

The team conducting the external review of EELA is composed of Alan Gibson and Kate Fogelberg. Alan Gibson has been closely involved with the development of systemic approaches to development over the last 15-20 years and with their application in different sectors — including within the climate change. Kate Fogelberg brings over a decade of experience working on innovative access programmes in Latin America.

Annex 2: Review Schedule

Date	Activity
17/10/2016	Meeting with Martin Dietschi, Swisscontact Meeting with Saskia Bauner, SDC
18/10/2016	Meeting with CADEPIA, La Paz Meetings with service providers (RIST, Pachaguaya) La Paz(Llojeta) site vist Interview with Mario Ramirez Meeting with INFOCAL
19/10/2016	Champa Rancho site visit Meeting with service providers (Energia H2O) Meeting with Sacaba local government authorities Site visit to Sacaba (Association of brickmakers, soil recovery pilot experience)
20/10/2016	Sipe Sipe site visit (rotating kiln, soil recovery inauguration) Meeting with Cochabamba state department environmental authorities Meeting with Swisscontact team
21/10/2016	Meeting with Vice Ministry of Micro and Small Businesses Meeting with Vice Ministry of Environment Meeting with PRODEM Wrap up meeting with Martin Dietschi
24/10/2016	Meeting with Swisscontact Regional team (Jon Bickel, Adrian Montalvo, Miguel Mucha, Jocelyn Bueno) Meeting with Martin Jaggi and Rafael Millan, SDC
25/10/2016	Meeting with Patricia Tord, CCAC, MINAM Meeting with PRODUCE (Cecilia Castro, Carmen Mora, and Richard Alca Meeting with Swisscontact Regional team
26/10/2016	Meeting with Luis Zapata, Swisscontact Peru Site visit to San Jeronimo Service provider interviews
27/10/2016	Site visit to Piñipampa

	Meeting with local government, Piñipampa Meeting with local government, San Jeronimo Meeting with Caja Cusco
28/10/2016	Wrap up meeting with Luis Zapata
3/11/2016	Meeting with SERPro
4/11/2016	Puebla site visit (brickmakers, firing service providers, Cuervo technology provider) ALTECSUS interview Caja Popular interview

Other interviews conducted remotely included:

- Reto Thoenen, SDC GPCC
- Patrick Sieber, SDC GPCC
- Catalina Etcheverry, CCAC
- Fredy Montenegro, EELA Ecuador
- Paola Herrera Cuellar, Aura Rodriguez, and Andres Garcia Bustos, CAEM, Colombia
- Joaquim Augusto Pinto Rodrigues, National Institute of Technology, Brazil

Annex 3: Notes on EELA's performance against specific terms of reference questions

1. Relevance

1.1 Relevance of the programme goals and objectives: to what extent do the goals and objectives of the programme remain valid?	Brickmaking is the second source of pollution after transportation in the region; overall valid as an approach to improving energy efficiency in brick kilns. Remains relevant in both climate change and economic development fields as fuel-reducing technologies and improved production technologies continue to create economic incentives for brickmakers to adapt changes that reduce fuel consumption. Each country, with the exception of Bolivia, has a concrete GHG reduction target as part of their Nationally Defined Contributions of the Paris Agreement.
1.2 Is the market approach relevant for the achievement of the programme goals?	Yes, for several reasons: 1) addresses root causes (technology, finance, and regulations) leading to high levels of pollution, as opposed to trying to directly provide support to brickmakers themselves; 2) market approach mirrors economic development that often happens regionally and not confined to geopolitical borders, most evident in the expansion of Brazilian and Colombian service providers and consultants, but also demonstrated in the technology transfer of the downdraft kiln from Peru to Ecuador to Bolivia; 3) commercial incentives of brickmakers and service providers have been aligned such that it is expected that the programme's benefits will continue and potentially expand following the end of direct programme support. The systemic approach was only applied to two of the three market system actors (technology and finance) and that influencing public policy was either not addressed (because it was generally facilitating the technology uptake (as in Colombia and Brazil), so the programme emphasized implementing policies; or because the potential to influence it was recognized to be limited (Mexico); whereas in other countries, the programme played a direct role in trying to influence public policy (Bolivia) by providing technical solutions to primarily political problems.
1.3 Are the country-implementing partners relevant in the development of the national results chains and for the achievement of the programme goals?	All countries engaged with market system actors in the technology, finance, and public policy sectors, albeit to varying degrees depending on the country context, consistent with the general analysis that technology, finance, and regulatory failures were root causes to underperformance and pollution in the brickmaking sector. Although all three are cited as market system failures, there was less analysis as to relative importance or relevance of each group of actors, or to what extent the programme could impact change in all three areas. With respect to technology service providers, common across all programmes was identification of service providers; demonstration of commercial opportunity by entering, expanding, or product diversification in the brickmaking sector; and linking service providers with brickmakers and financial institutions through demonstration firings, trainings, and local, national, and international events. Many programmes found it necessary to provide technical assistance in improving product design or introducing new technologies; Bolivia provided financial incentives to service providers to cost-share initial fan purchases, later shifting to a commission-based fee to catalyse sales; Peru and Ecuador additionally supported service providers with marketing materials and opportunities.

	<p>Financial institutions were also identified in each country, followed by the promotion of the business opportunity through the development of the PEFATs, whose use ranged from minimal to extensive, in the case of Brazil. Although finance was cited to be one of the major constraints, the evidence suggests that it was less of a constraint than earlier assumptions. Latest programme level data available (June 2016) suggests that of the 2263 pieces of equipment sold, only 390 were semi-or fully purchased using credit. This represents 17% of the total technological uptake, so it is reasonable to interpret finance as a constraint, but not the main constraint.</p> <p>All programmes engaged with government institutions at some level; whether this was informing and coordinating actions at municipal level, or trying to influence national policy. While it is well-recognised that the existence of relevant national emissions policies has been a driver of technological change, particularly in Brazil and Colombia, the extent to which an externally-funded programme can influence national level policy change in a rapidly-changing, politically-motivated environment is limited. Local government often has more incentive due to urban growth issues to act than national government, so it is not surprising to see more active participation from local governments, as was the case in Bolivia, Ecuador, and Peru.</p> <p>Some programmes expanded beyond these three groups of market system actors to include Chambers of Commerce, Associations of Brickmakers, universities, and the media, all of whom are also relevant for the achievement of goals. Several programmes reflected on the weakness in engaging with the construction/demand side of the brick market to encourage greater demand for environmentally friendly products.</p> <p>The involvement of local institutions as facilitators, such as CAEM in Colombia and INT in Brazil was a strategic decision that will most likely lead to continued involvement of both agencies in the brickmaking sector beyond EELA's programme period.</p>
1.4 Are the activities, outputs and the results chains of the programme consistent with the objectives and the attainment of programme goals?	Yes, with achieving goals, but not entirely with systemic change (i.e. lack of measurement of crowding in in all countries; lack of measurement of other technological adoptions and changes post-GHG goals in Mexico; late entrance into Santa Cruz market in Bolivia, where most brickmakers are located).
1.5 Are the activities, outputs and the results chains of the programme consistent with the intended impacts and effects?	Yes, with achieving impact, but not entirely with systemic change (i.e lack of measurement of crowding in, which is critical for sustaining impact over time).
1.6 In the spheres of intervention, are the activities, outputs, results chains and goals of EELA	As mentioned above, all of the countries have subscribed to the Paris agreement and published their Nationally Defined Contributions, which are further supported by national or sub-national policies in some cases. The work of EELA is aligned with the overall commitments in each country's INDCs, as detailed below:

Phase II consistent with the national or sub national policies of the industrial and/or air quality and/or forest?	<ul style="list-style-type: none"> • Bolivia: The NDC is a non-GHG mitigation target of "increased participation of renewable energy to 79% by 2030 from 39% in 2010. The work on renewable biomass fuels is of most relevance to Bolivia's contributions, since they have not committed to concrete GHG reductions by any date. Beyond the INDC, Bolivia's programme is well-suited in the National Development Plan, which seeks to balance economic and environmental development. In the absence of a sector policy, EELA Bolivia developed one, but this has yet to be implemented by the government, as the problem is just as much political as technical and national-level political incentives do not seem to be aligned with increased regulation of small brickmakers. • Brazil: The NDC is to reduce GHGs by 37% below 2005 levels by 2025. Both EELA impact chains-renewable biomass and kiln conversion-are and will continue to be relevant to the Brazilian goals. Brazil is one of two countries with existing national emissions regulation and technology adoption facilitated by EELA is contributing to national goals of emissions reduction. • Colombia: The NDC is to reduce GHGs by 20% with respect to BAU scenario by 2030. Colombia is the other country with a pre-existing national emissions regulation and the different technologies promoted by EELA in Colombia have and will continue to contribute to their national goals. • Ecuador: The NDC is to reduce GHGs by 20.4-25% by below the BAU scenario. Ecuador also has recently (2015) issued environmental regulation of brick production, but for producers with less than 40,000 production per month, compliance is voluntary, thus somewhat dis-incentivizing technological adoption by small producers. However, EELA efforts have recognized this and targeted their interventions in sub-national locations with more active local authorities who are incentivized to encourage cleaner production, as in the case in Cuenca. • Mexico: The NDC is to reduce GHGs and SLCPs by 25% from BAU by 2030, which includes reduction of 22% of GHGs and 51% black carbon. Given Mexico's explicit interest in black carbon reduction, EELA's focus on brickmakers is particularly relevant. The federalized nature of Mexico's government means that states are responsible for setting emissions limits, and to date 3 of 31 states have advanced in this regard. • Peru: The NDC is to reduce GHGs by 30% of BAU by 2030. Although Peru does not currently have national emission regulation, EELA Peru has been involved in draft proposals that may result in legislation following completion of the programme. Even in the absence of regulations, EELA is relevant for the country's international commitments.
1.7 Relevance of the monitoring system developed for the Phase II	MONELA is focused on impact targets with less emphasis on market system changes (for example, very easy to see headline figures of GHG and CHF targets consolidated; but less useful in assessing market system change across technology impact chains). Teams were not using MONELA to capture crowding in a consistent manner at the time of the final evaluation, which is key indicator in market development programmes.

	<p>It seems reasonable for measuring and demonstrating impact level goals, but exists alongside more detailed project management data that seems somewhat duplicitous of a process, as well as generating different figures which can cause confusion from an accountability and management. Emphasis on quantitative measurement; limited evidence of qualitative measurement beyond some narrative in semi-annual reports. Complementing quantitative data with qualitative data of selected enterprise changes would provide a richer analysis of programme achievements.</p>
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2. Effectiveness: analysis for each country component (considering also the national circumstances) and for the overall programme.

2.1 To what extent have the objectives and programme goals been achieved?	<p>At the impact level, the overall programme achieved 113% of its GHG goals by facilitating the reduction of 960K tonnes of CO₂, compared to its goal of 850K tonnes. Fuel savings, expressed as income increases, achieved 136% of the \$10,068,907 USD goal with \$13,663,097 reduced fuel costs. Enterprise reach was 70% of goal, even though CO₂ targets were exceeded.</p> <p>How programme goals were set was not explicit, especially regards to market system changes required to ensure benefits at the impact level were sustainable and scaleable.</p> <p>See tables in the text and annexes for further discussion on achievements per country and per goals.</p>
2.2 What were the major factors influencing the achievement or non-achievement of the objectives and programme goals in each country?	<p>Several external factors contributed to or hindered success in each of the countries. The three highest performing countries in terms of GHG reductions and fuel savings are Brazil, Mexico, and Colombia, which, unsurprisingly, are the countries with the more developed economies. In addition, both Brazil and Colombia had passed legislation regulating emission, which was also a key contributing factor to the success in each country. Conversely, countries without legislation had to rely primarily on fuel-reducing incentives to convince brickmakers to adopt technological changes. Although Mexico did meet their goals, they did so in the absence of a regulatory framework and during an initial period of recession in the construction sector. Further complicating the speed of early progress in Mexico was the change in partner from phase I to phase II. Bolivia was restricted by its weak national business and environmental regulations, but efforts at local government level coupled with organized producers contributed to success in Cochabamba, for example. Although regulations do exist in Ecuador, they are only voluntary for small scale producers (<40,000 bricks per month), so national regulation did not drive change there either. Local regulations and organized brickmakers were positive contributors to the extent of success in San Jeronimo, Peru.</p> <p>Phase I technology validation was generally a positive factor, building the evidence base and programme staff capacities. In the case of Mexico, the programme did not have a successful phase I pilot zone to be able to use as a demonstration in phase II, which contributed to delays in technology uptake in phase II. In Peru, the demonstration effect had the opposite effect in neighbouring Pinipampa, who expected a similar, intensive level of support from the programme, but this was not the case in municipalities located further away. Site selection also contributed to the nature of results; Puebla, Mexico, and Cuenca, Ecuador, were both cited as particularly innovative and entrepreneurial contexts, facilitating the uptake of technology. The “right-size” of technological options was a key contributing factor the overall success, allowing brickmakers</p>

	<p>to begin to produce bricks more efficiently with their existing kiln infrastructure, by adopting good practices or fans. The south-south exchange events, as well as national-level events, were cited by many participants as a key contributing factor to the spread of technology.</p> <p>Finance was identified during the phase I evaluation as the most significant barrier to technology adoption, but this only appears to be true in the case of kiln upgrading. Once the programme broadened its focus to more affordable technologies, most producers were able to finance the changes themselves. In the case of Ecuador, financial institutions already had access to green growth funds, which facilitated the uptake of loans there.</p> <p>Programme design issues also affected the speed of progress in Bolivia, in which the shift to a systemic approach was not adapted as early in phase II as it should have been. Although the Bolivia programme created several technical outputs for public policy, such as the spatial planning manual and the sector policy, neither have been adopted by national partners, reflecting the difficulty in providing technical solutions to political problems.</p>
2.3 Effectiveness of systemic approach (M4P) and country strategies	<p>Effectiveness refers to whether the programme did the right types of activities to achieve systemic change. In regards to technology, all of the programmes have been key in developing technology markets for brickmakers. Using a range of activities, such as national and international trade fairs, exchange visits among brickmakers, demonstration firings, some technical assistance to service providers (information, technical designs, promotional material support). EELA's work has transformed some clusters of brickmakers in each of the six countries, but since the programme did not have an explicit crowding in measurement strategy, it is unclear of the impact beyond the geographic areas where EELA and its partners were promoting technology uptake.</p> <p>Finance was cited to be the main constraint at the end of phase I, but this was in a context of promoting kilns, as opposed to other more affordable technologies. It is still true that finance is most likely one of several constraints to brickmakers adopting kilns, but this does vary from country to country. Equally important is the uncertain future many brickmakers face; many fear that they will have to be relocated in the short to medium term, creating conditions whereby they won't invest in more expensive, permanent kilns, even if they could afford to.</p> <p>No programme appeared to have applied a systemic analysis to the public policy barriers, and further analysis of this is given in the main document.</p>
2.4 Effectiveness in the introduction and consolidation of the results chains.	Impact chains did not seem to be used as a management tool, more so as an accountability tool. Example of not counting crowding in demonstrates that the M4P approach wasn't as embedded as it could have been. Market system level is not consolidated in MONELA beyond log frame, which is updated every six months as accountability tool, not a management tool.
2.5 Effectiveness in the South-South knowledge exchange and dissemination	The international and national events were cited by programme staff, brickmakers, technology providers, financial institutions and public authorities as a key trigger to investment. Anecdotal data from each country supports the importance of the events in generating change, but programme metrics only track number of participants who attended the events, not

as well as sector-to sector knowledge transfer	<p>the impact of the events on technological uptake.</p> <p>South-south exchanges were instrumental in introducing two technologies in Bolivia, the rotating gypsum kiln and the downdraft kiln. The trade fair in Puebla connected two entrepreneurs, who are now working in alliance to continue to develop products for the brickmaking sector after the programme has formally ended.</p>
2.6 Special review of the indicators used (suitability, effectiveness, measurability)	<p>Measuring the environmental impacts through GHG emissions is appropriate. A change in methodology during programme implementation provided more accurate measurements of GHG emissions. However, the name of the economic development indicator—"income increase" is misleading, as it is not an increase in income, but fuel saved. Measuring fuel savings is appropriate, but calling it income increases is not.</p> <p>Using Everett Rogers' theory of diffusion is also suitable to measure technology uptake. However, the calculations used to determine "critical mass" of GHG emissions, when less than X% of enterprises in the sector have adopted a change is a stretch. In Peru, for example, critical mass has been reached-using the definition of 75% of GHGs- with less than half of the estimated enterprises adopting a change. Interestingly, this can be understood as each enterprise becoming more efficient than assumed, but it is questionable that a sector has reached critical mass even with the target of 20% of enterprises. It may be critical mass of a programme's targets, but not of sector transformation.</p> <p>Crowding in is an important indicator in systemic change programmes, but there is limited evidence that the programme is actively measuring this beyond a comment field in MONELA. Several teams mentioned resource limitations in understanding and measuring crowding in, which is a weakness of the programme from a systemic change perspective.</p> <p>Market system changes are measured by the number of active partners (technology and finance) and products sold (technology or credit), as well as brickmaker awareness on the demand side, all of which are appropriate.</p> <p>Both public policy indicators are "number of countries;" yet, the programme is reporting "number of documents" instead of number of countries, so there is not consistency in what is reported. Greater analysis on what each country could realistically achieve in the public policy sphere and more appropriate indicators that reflected the impact and efforts in this area could have been done.</p>

3. Efficiency:

3.1 Were programme interventions cost-efficient?	<p>See tables in the text and annexes for detailed discussion, but overall it cost \$8/tonne of GHG reduced and \$0.56/\$1 income increase.</p> <p>The programme did not organize its budgets and activities per market system actor, so one cannot analyse how much effort was directed at each intervention, beyond a simple analysis of budget per component in the planning documents. Subsequent financial reporting did not continue to report by components, but at the outset, the GPCC programmed</p>
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	<p>budgeted 44,000 CHF of 5,200,000 CHF for public policy, which is less than 1%. Bolivia, financed by CORLAP, budgeted 163,974 CHF of 2,600,000 CHF, or approximately 6%. Both of these figures can be interpreted as the programme's decision to invest very scarce resources in public policy efforts. On the other hand, 80% (4,159,400 CHF) was budgeted from the GPCC funds for component one; and 60% (1,550,339 CHF) was budgeted for component one from CORLAP funds.</p> <p>While it is common to incur more staff costs in systemic change programmes, which are facilitative (by people) by nature, it does stand out that total expatriate costs of 1,041,000 CHF are 36% of the total regional budget or 20% of the entire programme (GPCC) budget.</p>
3.2 Were the programme goals achieved on time?	<p>At an overall programme impact level, yes. Bolivia and Peru are the only countries who are not reporting meeting their impact level goals, but Peru is very close (92%) and although Bolivia is further from their goals (31%), they are both on an upward trajectory.</p> <p>The only country to meet (and surpass) its enterprise goals was Mexico, reaching 2201 brickmakers of a goal of 1612. Overall, the programme met 70% of its enterprise reach goals, with the vast majority coming from Mexico (2201 of 3095 total).</p> <p>Other studies undertaken by the programme, such as the black carbon emissions and renewable biomass study in Brazil, were delayed significantly but should be finalized by the programme closing date.</p>
3.3 Was the programme implemented in the most efficient way compared to the phase plan?	<p>PRODOC included a budget by component type, but later budgeting and documenting did not follow this structure so difficult to assess overall how effective investments per component were. The regional office budget is 56% of the GPCC budget or 37% of the entire programme, including the CORLAP funds for Bolivia. Regional staff do not track their time towards specific components or country programmes, so it is not possible to assess the efficiency of the regional office beyond a total programme efficiency calculation, which is provided in the text.</p> <p>Compared to phase I, the second phase was much more efficient overall, with an average tonne of GHG reduced with an \$8 investment, compared to \$79 during phase I.</p>
3.4 Were the country markets efficiently stimulated to cover their gaps?	<p>At the programme level, 10% of brickmaking enterprises have adopted at least one change, compared to the 20% goal. These figures vary from country to country, from 1% sector reach in Brazil, to 18% in Ecuador. 17% of those changes were financed by loans, suggesting that finance is not the main barrier to technology adoption. 47 financial institutions are now lending to the brickmaking sector and 153 service providers are providing a range of technology and consulting services to the sector. Geographically, technology adoption has spread from single pilot zones to over 30 different geographical areas in the six countries. Initial evidence suggests that service providers will continue to provide equipment and consultancies to brickmakers and that financial institutions will continue to lend. It is less clear if the public policy efforts of the programme will translate into regulatory instruments that keep incentivizing technology adoption in the future.</p>

3.5 Was the EELA monitoring system (MONELA) efficient and replicable (for example in the NAMA process)?	MONELA has various inconsistencies among the measurement tools. Different figures appear in impact chains and log frame, for example, making effectiveness analysis complicated, particularly among market system goals and achievements, leading to the conclusion that the emphasis of MONELA was on impact targets, not the necessary changes at market level to achieve the impact targets. Relying on an external programmer results in delays and errors in the data presentation, which reduces its utility. See other MONELA comments (1.7)
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4. Impact of EELA:

4.1 Developed capacities of stakeholders and partners promoted by the programme in each country	<p>EELA's work has resulted in over 3,000 brickmakers (10% of the overall sector) implementing at least one technology change, but the range of changes varies greatly from country to country. In Brazil, the focus was on energy-efficient kilns and switching to renewable biomass, whereas in Peru, the focus was on both fuel-reducing adaptations such as good practices and fans, and production-enhancing equipment, such as extruders. In Bolivia, 34 brickmakers joined the Small Business Chamber of Commerce to continue to receive access to training and information. Some programmes worked in very conducive local environments to change, such as Puebla, Mexico, and Cuenca, Ecuador, and while the programme surely contributed to acceleration of changes in those areas, the entrepreneurial nature of those contexts is one of the important reasons for success in those areas.</p> <p>Similar to results in other areas, the impact on service providers is greatest in terms of numbers now involved in the sector, with over 150 enterprises now offering goods and services to the brickmaking sector. One of the more interesting dynamics has been the expansion of Brazilian and Colombian service providers in Peru, Bolivia, and Ecuador, consistent with regional market growth, but facilitated by the programme. EELA Brazil included fuel suppliers in their approach, which is an important contribution to the shift towards renewable biomass fuel sources.</p> <p>Financial institutions have been made aware of the opportunity in the brickmaking sector, and it appears that the PEFAT was used by the EELA Brazil team to help convince banks of the potential in the brick sector. EELA Ecuador was able to convince one of their financial partners to include the downdraft kiln as a technology option for preferential environmental credits. A cooperative partner in Mexico, Caja Popular, is analysing the possibility of creating a financing scheme similar to others in existence in which the equipment itself is treated as a guarantee, and have clear incentives to continue and expand their lending to the brickmaking sector. In other countries, banks continue to analyse clients' using their own internal processes, and while some will most likely continue to lend when clients meet their requirements, there is insufficient evidence to conclude that all will continue to actively pursue brickmakers as clients.</p> <p>Public authorities, similar to analysis elsewhere, have the least developed capacities. Part of this is due to the nature of frequent rotation in government, but it also linked to the relatively weaker involvement of the programme in the public policy area compared to technology, for example.</p>
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	All implementing partners, be they Swisscontact or SERPro, CAEM, or INT in Brazil, commented that the systemic change framework positively contributed to their professional or institutional development.
4.2 Importance/relevance of climate change mitigation and increased income for brick producers in each country	In all of the countries, brickmakers are motivated by cost savings; reduced GHGs is an effect of adopting more energy efficient technologies in all of the programmes.
4.3 Importance/relevance of climate change mitigation and reduction of air pollutants for decision-makers (What real difference has the activity made for the beneficiaries?)	<p>This can be understood as demonstration of creation of or implementation of clean air/climate change policies. Brazil and Colombia had both already created regulations, which is a sign of their government commitment to environmental issues. Ecuador also recently passed legislation, but limited its enforcement to large (>40,000 bricks/month) companies. Mexico's federalised nature of government allows states to create and regulate their own emissions, and to date, 3/31 countries have created policies. Peru has had a draft policy for several years, but yet to finalise the proposal. Bolivia does not have national legislation, and complicating matters there is overlapping responsibility for emissions regulations between two different national government bodies (Mother Earth Authority and the Ministry of Environment).</p> <p>All of the countries have signed onto the Paris Accords, and with the exception of Bolivia, they all have GHG reducing goals over the next 10-15 years, which is an additional indicator that they may start to adopt more policy instruments to regulate emissions.</p>
4.4 Usefulness of EELA tools and outputs for the private and public sector in each country	<p>The overall data that EELA has generated –from very basic sector size, geographic concentration within countries, production estimates, and environmental impacts–was one of the oft-cited praises of the programme, from international partners to local technology providers. It is clear that this basic information was one of the root causes, and EELA throughout the region has contributed positively to the growing data sources on brickmaking in Latin America.</p> <p>Most programmes found the use of the PEFAT to be more of an internal capacity-building tool, thereby increasing their own knowledge and confidence in communicating the opportunities in the brickmaking sector, rather than a tool to be used by financial institutions to determine creditworthiness. For a bank to decide to lend for a fan, it does not appear they needed the extensive analysis provided by the PEFAT.</p> <p>The exception is Brazil, where the team there did use the tools developed with financial institutions, which is perhaps reflective of the nature of investment required in Brazil, as kiln conversion was one of the main areas of focus and required significant investment. The use of the PEFAT in Brazil resulted in more informed loan officers, who began to offer technological advice to brickmakers; for example, helping the client analyse which kiln would provide the best ROI for their particular circumstances.</p> <p>The “good practices” manuals developed were cited by several partners as an appropriate entry point to working with brickmakers, as it allowed for incremental adjustments without extensive infrastructure investment.</p>

	<p>Brazil's research into renewable energy fuel sources is an important contribution to the sector's efforts at producing carbon neutral bricks.</p> <p>As is described elsewhere, less immediately useful have been national policy efforts, such as the sector policy and spatial planning manual in Bolivia. Municipal policy tools, such as environmental ordinances, have been created and implemented during the programme's timeframe, again reflecting the speed at which changes happen at local versus national levels. Technically, public policy instruments produced are of high quality, but the challenge is in public ownership and incentives to implement them.</p>
4.5 Improved activities of climate change mitigation and increased income (quality and improvement of the type of activities)	Climate change and income benefits are clearly derived from commercial investments in more energy efficient technology. The adoption of renewable biomass in Brazil and Bolivia contributes to even greater GHG reductions.
4.6 Estimate of the quantity of beneficiaries and benefits of EELA Phase II	3095 brickmakers (10% of the sector in the 6 countries) have collectively reduced over 960,000 tonnes of GHGs and reduced fuel costs by \$13.6 million dollars. Additionally, 47 financial institutions are reported to be lending to the brick sector and 153 service providers are now selling goods and services to the sector.
4.7 Feedback from EELA stakeholders' participants of the result chains	EELA is generally well-regarded by its many diverse stakeholders, from international coalitions, to brickmakers' themselves, to service providers, banks, and public authorities. Some of the highlights include the "right-sized" nature of EELA's support; i.e, the development of good practices' trainings and the promotion of fans, both of which were relatively easy for brickmakers to implement with their existing infrastructure and have fast returns on investments. The importance of EELA in increasing the visibility of the brickmaking sector was also often cited as one of the strengths of the programme. And finally, the systemic approach was another innovative, and positive contribution of EELA to the climate change and enterprise development fields.
4.8 Impact and contribution of EELA on public policy in each country where activities are held	Brickmaking occurs in clusters in all of the countries of operations, thus diluting its importance at a national level. Thus, the impact of EELA on public policies can be most clearly seen at local levels of government, where local authorities have more incentives to address issues caused by brick production. This is true in the case of Bolivia, in which two municipalities have issued regulations aimed at promoting cleaner technologies in the brick and gypsum sectors. Ecuador also experienced success at the local level in brokering environmental licenses between brick makers and the local authorities in Cuenca. Peru's experience of generating local (non-binding) ordinances banning the use of tires as fuel and requiring fan use contributed to the 2012 Momentum for Change Award, but limited evidence of continued public policy success in Phase II was noted. In countries like Brazil and Colombia, EELA was effective at communicating the implications and options for compliance with regulations, but did not need to lobby for emissions regulations since they already existed.

	There has been less impact overall with national level advocacy efforts, due in part to the slower timeframe for national changes to occur, but also due to the localized nature of brick production.
4.9 Identification of cross-cutting themes addressed by EELA including climate change policy, clean air policy, regulatory framework and innovation	Many of the EELA programmes confronted similar issues, albeit in different contexts, such as small business formalization; the (lack of) research and development in the brickmaking sector; and spatial planning.

5. Sustainability:

5.1 Are the country brick markets working more efficiently than at the start of the programme?	Figures suggest that 10% of the brickmaking sector is operating more efficiently now than at the beginning of the programme. Production costs and times are being reduced by the adoption of energy efficient technologies, and some producers have expanded their output and/or diversified their production. The reach of the programme is no longer confined to individual pilot zones, but throughout entire countries. Some of this is due to new regulations entering into effect during the last six years, such as in Brazil and Colombia, while other countries' efficiency and growth was facilitated by a boom in the construction market (Mexico).
5.2 After the EELA programme intervention, is the brick market working sustainably and with less failures in each country?	As mentioned elsewhere, it is very likely that brickmakers who have adopted technology changes will continue to practice them in the future. Enterprise reach was on average 10%; with ranges from 1% in Brazil to 18% in Ecuador, so there is still a lot of room for the sectors to continue technology adaption. What is somewhat less clear, is how additional technology change will happen. An encouraging example from Mexico, however, shows that entrepreneurial individuals are in the process of introducing a new technology to market that would reduce the labor-intensive moulding process by adopting the <i>moldeadura</i> . They started this process as EELA was finishing, and all signs point to their continued investment in the sector. How change will continue to spread from the localized clusters of brickmaking is one of the challenges that still remains.
5.3 Will the brick market operate effectively for everyone in each country after the EELA programme completion?	For those who have already adopted a technological change, it is most likely they will continue in the future as the fuel savings are tangible and immediate. What is less clear is if brickmakers will all continue to adopt additional GHG-reducing, income-enhancing technologies, such as cleaner (and larger) kilns or renewable biomass. Any programme targeting efficiency will most likely contribute to a reduction in the overall size of the brickmaking sector; some producers will choose not to make energy improvements and will most likely eventually be forced to shift to other income-generating activities if they cannot compete with increasingly more efficient competitors. One reflection is that the second phase of the programme treated all brickmakers as the same; however, in the case of Peru (Pinipampa) and Colombia, there were areas of relatively poorer, more risk-averse brickmakers who were slower to

	adopt new technologies and a sense that the programme should follow the same methodology for all brickmaking populations.
5.4 Sustainability of effects or changes promoted by the programme in the country components.	Changes at the enterprise level will most likely be sustained as the economic incentive is clear and tangible. How change continues to be spread to additional cluster areas is less clear. Service providers do have a commercial incentive to continue to serve the brickmaking sector and they will most likely continue to do. Financial institutions will most likely continue to lend to qualified brickmakers, and the recent example of a financial institution including the downdraft kiln as a preferential green credit option is a positive sign. Less certain is the sustainability of public policy efforts, as evidence suggests that the lack of regulations (or enforcement of them) is more of a political incentive issue than a technical capacity one.
5.5 To what extent would the benefits of the programme continue in each country component after donor funding ceases?	See 5.3 for comments regarding continued and increased technology use by brickmakers. Service providers have seen the commercial benefit of providing machines and knowledge to the brickmaking sector, and there is compelling evidence that many of them will continue to do so. For example, Brazilian providers are already organizing an event in Peru to demonstrate their continued interest in the sector; and an emerging alliance in Mexico between two service providers and a financial institution has already demonstrated their continued interest in developing and financing new technologies for brickmakers. It is less clear that the public policy technical outputs provided by the programme will be implemented in the short or near term, which is not a comment on the quality of the outputs, but rather the political incentives required to initiate change in either the environmental or business sectors.
5.6 Identification of stakeholders who will continue with EELA market promotion activities after programme completion	Service providers will most likely be the main market system actor to continue with market promotion activities as they have increased capacities and incentives to do so. Some financial institutions will most likely continue, but unlikely that the entire group reported will do so. In each of the countries, there is one first mover financial institution who will probably continue, and other financial institutions may copy them eventually. Public authorities in the countries with existing national regulatory frameworks (Brazil and Colombia) will continue to drive technology change forward as part of regulatory compliance. National governments have made commitments to the international community as part of the Paris Agreement, but it is too early to tell if or how they will incorporate energy efficient technologies in the brick sector into their national plans beyond what already exists. Interestingly, it is most likely that two of the implementing partners-CAEM (Colombia) and INT (Brazil) -will also continue with the more general activities of information-sharing and promoting energy efficiency in kilns, highlighting the strength of the programme in selecting local partners who may have a long-term role in the overall functioning of the market. In addition, at least two EELA staff members have also identified the sector as one ripe of opportunities and have decided to continue to work in the sector following programme completion.
5.7 What were the major	See discussion in point 2.2, as many of the factors that contributed or inhibited the implementation of the programme are

<p>factors which influenced the achievement or non-achievement of sustainability of EELA in each country?</p>	<p>the same factors that will affect the sustainability of EELA. For example, in countries with emissions regulations (Colombia and Brazil), it is assumed that those same regulations will help ensure the sustainability at the enterprise and market system level. Similarly, in enabling local environments, such as Cuenca and Puebla, it is most likely that the benefits accrued during EELA will continue. The emergence and growth of new business models to facilitate the uptake of technology is another positive contributing factor to sustainability. For example, the sharing of fans among associations of brickmakers (common in Peru and Bolivia); the loaning of municipal purchased equipment in Ecuador to brickmaking constituents; or the expanded firing services in Mexico unfolded in the course of the programme, but will likely continue to provide benefits to more than just individual enterprises. Bolivia was the only country using a programme cost-share to facilitate technology transfer, and while the amounts decreased over time for fans, the cost-share for kilns was more significant and it remains to be seen if others will decide to build kilns at full cost.</p> <p>Public policy was not treated as a systemic issue and it is questionable whether or not the public policy efforts will be sustained.</p>
<p>5.8 Analyse the perspective of the brick sector into the in the CCAC</p>	<p>Only three of the six countries-Peru, Mexico, and Colombia-are members of the Climate and Clean Air Coalition. Switzerland is a member of the CCAC and the lead member for the bricks initiative, demonstrating the country's commitment towards a cleaner production of bricks. It is clear CCAC values the work EELA has done, in particular the depth of data on the brickmaking sector in Latin America. The role of the coalition is primarily awareness raising amongst governments on the importance of reducing black carbon, in the case of the brick sector.</p> <p>Regarding the activities done in conjunction with CCAC, the south-south exchanges as previously mentioned were a key contributor to spreading more efficient technology within the region. Although Chile was not a country programme for EELA, technical knowledge gained by EELA programme staff in Chile resulted in an improved kiln design in Moqueagua, Peru. In Mexico, CCAC's financing of international experts deepened the technical expertise available at exchange events. And in Colombia, detailed regional inventories of brickmaking sector will fill an information gap in the country.</p> <p>Although CCAC primarily provides an advocacy/awareness raising function at government level, it could be even more effective by including civil society awareness activities, as is being done in Peru. CCAC –as an awareness raising and information sharing entity-could and should advocate for similar market-based approaches in other areas with brick production lacking energy efficient technologies or even other clean air or climate change challenges to complement the main thrust of their work trying to convince government authorities to adopt regulations.</p>

Annex 4: A systems approach to the public policy space

One point to emerge from this final external review report of EELA is that the programme did not approach its work in the public policy/regulation space through the same market systems lens as it used in looking at other areas such as technology and finance. The review concluded that this undermined the programme's performance. This brief annex builds on the analysis contained in the report to consider three questions:

1. What does it mean to look at public policy through a systems lens?
2. Why is it important to do so?
3. What are the implications for programmes?

1. What does it mean to look at public policy through a systems lens?

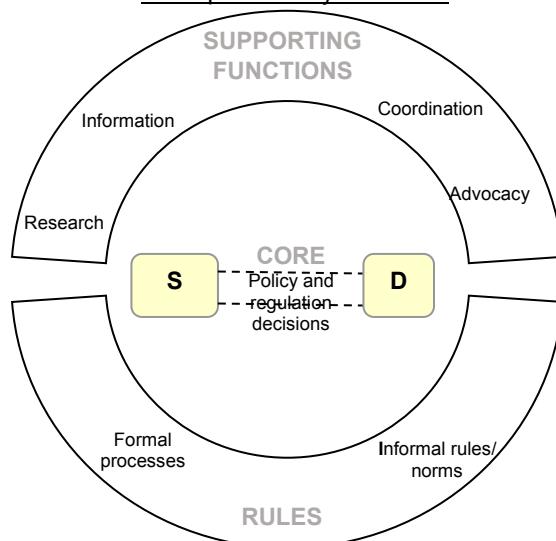
At first sight, it may not be obvious that the market systems framework has relevance for public policy. How can public policy be considered as a market system? First, dealing with the awkwardness of the terminology, if the term 'market' causes confusion, it might be simpler to refer to the public policy or regulatory system¹¹. However, the essential framework is the same as is used for conventional markets for goods and services. Figure 1 highlights the main elements of this system.

The core of the system – the policy and regulation changes with government (local, regional, national) on the 'supply-side' and citizens and businesses (individually and in associations), including the brickmaking sector, on the 'demand-side'. Policies and regulations can relate specifically to brickmaking (eg emissions, technologies) or apply more generally including to brickmaking (eg business formalisation, extraction laws). Formal self-regulating standards can also be developed by industries themselves though most of the brickmaking sectors in EELA countries – apart from Colombia and Brazil – are not sufficiently organised to do this.

The task of development agencies is to help the outcomes of the policy and regulatory process to be more effective, providing the right 'signals' to the industry to improve its operational behaviour and competitive and environmental performance.

Rules – this includes the formal processes through which policies and regulations are developed, including consultation. However, of particular importance here are the informal rules or incentives associated with the policy space that shape the behaviour and decisions of officials and politicians.

Figure 1: Public policy system schematic – examples of key functions



¹¹ This is referred to as a 'political market system' in the documentation on market systems approaches – *M4P and Political Economy: Perspectives on the Making Markets Work for the Poor Approach*, DFID/SDC, 2008.

The task of development agencies is to seek alignment between its overall objectives and the incentives of the officials and politicians – for example, regulations that result in cleaner air for communities (which is also desirable for local officials and politicians) but which are achievable through adoption of particular efficiency-raising technologies.

Supporting functions – these are concerned with a range of functions such as information, research and advocacy that provide both supply-side (regulators) and demand-side (brickmakers) with the ‘raw material’ to shape their views and actions. Key players here can include the media, civil society and community groups, environmental pressure groups, specialised researchers and business associations.

The task of development agencies is to facilitate the emergence of appropriate information and knowledge – communicated in an effective form - that will allow better decisions to be made. These may include both public (eg some types of research) and private services (eg commercial media).

The picture that emerges for the policy and regulatory system therefore is one where multiple actors are potentially involved – not just government officials and brickmakers but politicians, associations, the media, researchers, civil society and others – playing a range of related roles. Looking at the public policy space through a systems lens means (1) understanding the complexity of this system and (2) recognising that meaningful, sustainable change requires improving the system, not just individual laws.

2. Why is it important to look at public policy through a systems lens?

The main reason for viewing public policy/regulation in this way is that, as elsewhere in international development, learning from experience has shown the limitations of regarding regulatory change as a narrow, technical task of drafting and delivering new policies and regulations. Interventions of this type are likely to result in regulations that are ineffective. Successful policies emerge when sustainable policy process are developed that engage with the key players, are informed by appropriate analysis, and have allowed different stakeholders to gain ownership, and where final outcomes allow consistency between the incentives of both the supply-side (decision-makers) and the demand-side (brickmakers) and the objective of GHG reduction.

One major authority in this field, Scott Jacobs, summarised this learning succinctly “*Because the problem of poor business environments is systemic, genuine solutions must also be systemic*”¹². This learning is therefore a rejection of conventional ‘technical-fix’ development interventions. Technical knowledge is still required but is only likely to be successful when utilised in pursuit of system change.

3. What are the implications for programmes?

A number of implications follow from a commitment to taking a systems lens to the public policy space and therefore of setting the intervention task as working to address the system – not just to change regulations.

- A commitment to first understand the existing system – for funders and implementers alike, this is a starting point. Before engaging in public policy first understand the public policy space!
- A broader number and type of partners – rather than only working directly with government regulators (at different levels) other types of player are likely to be important, including researchers, the media and civil society groups. CCAC might also be seen as a relevant player in some instances.
- A broader range of activities – as well as technical advice, intervention activities may include, for example, awareness raising with the media, commissioning research and supporting its publication, and supporting networking and exchange events.

¹² Jacobs, S (2007); *How broad-based reforms succeed in changing the business environment: the strategic use of drives of change*; Asia Consultative Conference on Creating Better Business Environments for Enterprise Development; Asian and Global Lessons for More Effective Donor Practices, Bangkok, Thailand, Dec., 2006

- Explicitly taking account of incentives – while in commercial markets providers' incentives are relatively simple to assess, with government organisations, issues of career, ideology and power are likely to become important. Taking account of the political economy around these public policy processes inevitably complicates intervention but is essential if key constraints are to be identified.
- Different metrics for assessing performance – not just changes to regulations but assessment of other indicators such as the usefulness of regulations, perceptions of the process and of green technology changes, incidents of conflict, and compliance with new ordinances.

For SDC, strategically, the overall implication is that programme designs reflect this view of public policy. For implementation partners such as Swisscontact it means reorienting their views on public policy in the same way as, in earlier years, they have done in other fields – such as technology and finance – where the market systems approach was also once new. None of the above implications make intervention in the public policy space any *easier* - engaging here is arguably more difficult than in 'normal' product markets – but rather increases the chances of success.