WORLD ECONOMIC FORUM

COMMITTED TO IMPROVING THE STATE OF THE WORLD

Industry Agenda

Bridging Skills and Innovation Gaps in Latin America: Country Implementation of the Competitiveness Lab

Prepared in collaboration with Deloitte

November 2016

World Economic Forum®

REF 051216

Contents

Preface

Many factors, interacting in complex ways, determine a country's competitiveness, or its ability to increase productivity. The World Economic Forum benchmarks these factors every year in *The Global Competitiveness Report*, showing how countries advance or fall behind on each factor, ranging from basic education and health to innovation and the transfer of technology.

Building on a long tradition of competitiveness research and benchmarking, the Forum designed the Competitiveness Lab project to help bridge gaps in competitiveness through focused public-private work that is facilitated by the Forum and leads to agendas with actionable reform. Based on the report's results, and under a mandate from the business and government partners' meeting at Davos-Klosters in 2014, the Forum identified the factors where Latin-America lags the most: skills, technological readiness and innovation. Following this initial diagnosis, a detailed analysis and policy recommendations were presented at the World Economic Forum Annual Meeting 2015 and validated at the World Economic Forum on Latin America 2015 in Riviera Maya, Mexico.

The Competitiveness Lab's Insight Report of January 2015, *Bridging the Skills and Innovation Gap to Boost Productivity in Latin America*, was well received, and the Forum was encouraged to continue with a second phase that moved beyond diagnosis and into action. The Lab's Phase II, a country-level initiative, debuted in Colombia in 2015 and Mexico in 2016, with multistakeholder workshops prioritizing the Insight Report's recommendations and identifying which one recommendation could successfully be promoted through public-private collaboration. While the World Economic Forum believes that making progress in competitiveness requires sound diagnosis and detailed analysis, it demands, above all, multistakeholder collaboration. Garnering efforts from relevant private- and public-sector entities and agencies in specific projects is one way to design actionable and impactful initiatives to close the gaps.

This report presents the Colombia Competitiveness Lab in detail, and a summary of the Mexico Lab, which is published in Spanish as a companion report. Both plans have been incorporated into the respective competitiveness agendas under steering board-member leadership. The Forum looks forward to implementing the jointly developed work plan and collaborating in the future with Colombia and Mexico, as well as other Latin American countries, within the Competitiveness Lab model.

Contributors

Latin America Competitiveness Lab – Colombia Steering Committee

Cecilia Álvarez-Correa Glen, Minister of Commerce, Industry and Tourism of Colombia
Carlos Andres Uribe, President, Ladrillera Santa Fé, Colombia
Jaime Bermúdez Merizalde, President, MBA Lazard, Colombia
Jaime Bueno Miranda, Presidential Adviser for Competitiveness and Innovation System, Office of the President, Colombia
Lourdes Casanova, Senior Lecturer, Management; Academic Director, Emerging Markets Institute, Samuel Curtis Johnson Graduate School of Management, Cornell University, USA
Rosario Córdoba, President, Private Competitiveness Council, Colombia
Yaneth Giha Tovar, Director, Colciencias, Colombia
María Claudia Lacouture, President, ProColombia, Colombia
Jorge Londoño Saldarriaga, Member of the Board, Financiera de Desarrollo Nacional (FDN), Colombia
David Luna Sánchez, Minister of Information Technologies and Communications of Colombia
Angel Melguizo, Head, Latin American and Caribbean Unit, OECD Development Centre, Organisation for Economic Co-operation and Development (OECD), Paris
Luis Guillermo Plata, President, ProBogota, Colombia
Daniel Quintero, General Director, iNNpulsa, Colombia
José Manuel Salazar Xirinachs, Assistant Director-General and Regional Director, Latin America, Caribbean, International Labour Organization (ILO), Lima
Claudia Vasquez, President and General Manager, Latin America, CA Technologies, Colombia

Latin America Competitiveness Lab – Mexico Steering Committee

Enrique Cabrero Mendoza, Director-General, National Council of Science and Technology (CONACYT), Mexico
Juan Pablo Castañón, Chairman, Business Coordinating Council, Mexico
José Franco López, General Coordinator, Scientific and Technological Advisory Forum, AC, Mexico
Brian Gallagher, President and Chief Executive Officer, United Way Worldwide, USA
Rogelio Garza, Undersecretary for Industry and Commerce, Ministry of the Economy of Mexico
Ildefonso Guajardo Villarreal, Secretary of the Economy of Mexico
Ricardo Hausmann, Director, Center for International Development, Harvard Kennedy School of Government, USA
María de Lourdes Dieck Assad, Dean, EGADE Business School, Monterrey Institute of Technology and Higher Education (ITESM), Mexico
Juan Rebolledo Márquez Padilla, Director, Productivity Unit, Ministry of Finance and Public Credit of Mexico, Mexico
Angel Melguizo, Head, Latin American and Caribbean Unit, OECD Development Centre, Organisation for Economic Co-operation and Development (OECD), Paris
Elías Micha Zaga, Director, Science, Technology and Innovation, Office of the President, Mexico
Juan Pardinas, General Director, Mexican Institute for Competitiveness (IMCO), Mexico
Armando Paredes Arroyo, President, Business Coordinating Council (CCE), Mexico
Alejandro Ramírez, Chief Executive Officer, Cinepolis, Mexico
Maria del Rocio Ruiz Chavez, Undersecretary of Competitiveness of Mexico
Alvaro Rodriguez Arregui, Co-Founder and Managing Partner, Ignia Partners, Mexico
Samuel Ronquillo, Vice-President, Innovation, Arendal, Mexico
Carlos Salazar Lomelin, Chief Executive Officer, FEMSA, Mexico
Katya M. Somohano Silva, Head, Investment Promotion Office, Federal Electricity Commission (CFE), Mexico
Blanca Treviño, President and Chief Executive Officer, Softtek, Mexico

At the World Economic Forum

Marisol Argueta, Head of Latin America, Member of the Executive Committee
Margareta Drzeniek-Hanouz, Head of Global Competitiveness and Risks, Member of the Executive Committee
Daniel Gomez Gaviria, Head of Competitiveness Research
Fernando J. Gómez, Director of Latin America

At Deloitte

Erick J. Calvillo, Lead Industry Partner, Consumer Business, Deloitte, Mexico
Christian Gardey, Manager, Deloitte, Argentina

1. Executive Summary

1.1 Introduction

Latin American political leaders, as well as those from the private and public sectors, face both a challenge and an opportunity to boost competitiveness by addressing the region's lag in productivity. Supporting the transition towards higher levels of productivity will be key to the region's well-being and prosperity. This will depend on the proper functioning of its institutions, the quality of infrastructure, the allocation of production factors and, crucially, the strengthening of the region's base of skills, technology and innovation.

This report applies, at the country level, the recommendations stemming from the outcome of Phase I of the Latin America Competitiveness Lab. That phase is seen as a step forward in supporting the region to improve its competitiveness by bridging the skills and innovation gaps identified as crucial lagging factors.[1] The Competitiveness Lab seeks to achieve this by providing support and facilitating public-private collaborative initiatives based on renowned benchmarking tools and original analysis.

1.2 Context and objective

Despite the recent, rapid economic growth experienced by several Latin American countries during the commodity boom, the fall in commodity export prices, including oil, coal, other minerals and agricultural products, has underscored the many competitiveness challenges required for new growth sectors to emerge.
Improvements could be made in many areas, and the skills and innovation gap ranks high on the list. Other areas for improvement include education, on-the-job training, scientific and technological investments by both government and business, and enhancing the innovation environment.

In 2014, the World Economic Forum began the Competitiveness Lab initiative, focused on identifying the main gaps in competitiveness in Latin America and possible responses. Ten recommendations (Figure 1) for bridging such gaps in skills and innovation were proposed.

Figure 1: Bridging Competitiveness Gaps in Latin America, 2014

	Priority	Recommendation
	Strengthen framework conditions	1. Maintain focus on policies that establish the fundamentals of a well-functioning economy
	Enhance efficiency of investment	2. Enhance policy effectiveness by assessing current policies, establishing evaluation criteria, and monitoring and managing capacity
		3. Align investments to champion economic and social priorities
	Increase the level of investment	4. Increase private investment in skills and innovation development
	Build stronger public-private collaborations	5. Create a standardized catalogue of research competencies
		6. Design public-private research and skills development funding schemes
		7. mDefine and implement cross-sectorial vocational education and training programmes
	Foster intra-regional cooperation	8. Establish a regional multi-annual research and innovation fund
		9. Enable a freer flow and exchange of students and researchers in the region
	Employ a flexible approach for implementation	10. Start small and opt in

Source: World Economic Forum, *Bridging the Skills and Innovation Gap to Boost Productivity in Latin America – The Competitiveness Lab: A World Economic Forum Initiative*, January 2015

The Forum decided to go beyond regional-level recommendations and take these findings to the country level to work with local stakeholders. That approach set the basis for improving their innovation environment through an agenda of public-private collaboration that would implement the report's recommendations. This new phase aims to address country challenges by building a sustained and informed multistakeholder process that can help identify and shape the skills and innovation agenda.

1.3 Structure of this report

This report presents the Colombia Lab's conclusions, a work plan for designing public-private funding schemes to support innovation efforts (with the example of energy efficiency), as well as a brief summary of the Lab in Mexico, which is presented in a companion report in Spanish. The report includes several international case studies of what other countries have done with similar challenges. In addition, it covers the methodology – from country selection to Lab implementation and governance – with the objectives of providing a replicable methodology and presenting the lessons learned from the pilots.

1.4 Phase II: Moving from the regional to the country level

The Competitiveness Lab's Phase II began by assessing and selecting the first two countries, Colombia and Mexico, to partner with the Forum. The Forum's multistakeholder communities helped to identify experts in competitiveness, skills and innovation from the two countries. Moreover, to advance a concrete, actionable plan, the Forum formed a governance structure by convening a high-level steering committee and a working group for each country. For example, the Colombia Working Group included public- and private-sector actors, such as the Presidential Adviser for Competitiveness; the Minister of Commerce, Industry and Tourism; the directors of Colciencias and iNNpulsa; the Private Competitiveness Council; and prominent chief executive officers (CEOs) from the Forum's Strategic Partners. The Mexico Steering Committee was chaired by the Minister of the Economy, and included representatives from the Ministry of Finance, CONACYT, the Presidency, INADEM, the World Bank and the Inter-American Development Bank, among others.

The members of both Steering Committees and Working Groups made it possible to reach the countries' Lab objectives. Thereafter, development commenced with an actionable agenda to design a work plan for the countries to implement the Forum Insight Report's recommendations for bridging skills and innovation gaps.

The first step was a kick-off workshop in June 2015, with senior representatives from the public and private sectors as well as academia, where participants characterized the recommendations according to their relevance and feasibility in successfully accelerating innovation in each of the two countries. This exercise led to selecting one policy recommendation, from which the Steering Committee and Working Group members developed a project proposal and further set of recommendations.

1.5 Workshops and findings

The Competitiveness Lab's Phase II kick-off workshops, attended by ministers, CEOs and representatives from civil society, cited the need to design new public-private financing schemes for innovation as the top priority in both countries.

The Competitiveness Lab in Colombia identified the energy sector and, in particular, innovation in energy efficiency as the targets for a new public-private collaboration. Energy costs, identified as a priority area in the National Development Plan, national research priorities and competitiveness assessments, ranked high in the national conversation. However, and despite the existence of funding initiatives, the Working Group and Steering Committee found that the project could make a valuable contribution to the country's approach to competitiveness by coordinating and pushing this agenda forward.

In Mexico, the Working Group identified both short- and long-term agendas for reform of existing innovation financing schemes under the leadership of the Ministry of Economy and CONACYT. In the short run, the Lab suggested modifying the existing rules to better incorporate an accountability mechanism, correspondability and risk sharing. In the long term, the recommendations included revising governance, increasing transparency through internet-based information systems and improving private-sector participation. Based on prioritizing plans for national development and industrial strategy, the Lab identified three sectors eligible for pilot financing: agroindustry, medical devices, and moulds and dies.

The Latin America Competitiveness Lab's long-term objective is to deepen and broaden this engagement with the region's leaders to broker public-private collaboration and intra-regional cooperation, encourage better decision-making and support transformative processes.

2. Colombia's Path to Productivity and Competitiveness

Background and context

Colombia has produced a number of policy strategies for science, technology and innovation (STI) over the past years. The Consejo Nacional de Política Económica y Social (National Council for Economic and Social Policy, or CONPES), whose objective was to design policies and strategies for higher education linked to science, technology and competitiveness, established the first regulatory framework in 1990 and strengthened it through a further document in 2002.

The strengthening process continued in later years through further policies for developing STI that came with the consolidation of Colciencias, a Colombian government agency that promotes public policies for STI and supports fundamental and applied research in the country. However, critics have argued that no long-term vision exists, and a lack of coordination prevails between STI and competitiveness.

Current government efforts seek to produce both a new long-term policy framework as well as further coordination and articulation of the STI system and the National Competitiveness System. Within the framework of the National Development Plan 2014-2018 (NDP 2014-2018), a draft document for CONPES was prepared in 2015 to lay the groundwork for Colombia's new STI policy. This draft STI document, which has not been adopted by the Council, identified objectives and policy actions in four main areas:

- Train: improve workers' skills in STI, with criteria for quality and relevance, to enable Colombia's development based on knowledge generation
- Investigate: build research capabilities, with regional specialization, a long-term strategy and high impact internationally
- Transfer: build and improve conditions to allow the private and public sectors to identify and use knowledge and technology
- Innovate: create and strengthen the links, conditions and capabilities within the system to stimulate innovation

A sister document on productive development policies provides the link between the STI and productive development. Known and passed as CONPES document 3866 of 2016, it laid the ground for more effective government policies to improve productivity by improving coordination between the national and subnational government, and between the private and public sectors. It also presented criteria for prioritizing policy, choosing policy instruments for solving market failures and implementing a system of experimentation and learning. This document's principles were applied in some topic areas, including technology and innovation policy, financing, value chains and trade, and human capital.

The World Economic Forum launched the second phase of the Competitiveness Lab within the context of these new efforts to formulate long-term policies within the National System for Competitiveness, Science, Technology and Innovation. This phase seeks to prioritize the recommendations from the Insight Report and focus on one of them, as well as provide a mechanism for boosting efforts and new inputs in developing policies.

General objectives of the Latin America Competitiveness Lab kick-off workshop (June 2015)

- Present the results of the Latin America Competitiveness Lab's Phase I (2014-2015)
- Assess how the region's recommendations apply to Colombia
- Identify areas where development may benefit from stronger public-private collaboration facilitated by the World Economic Forum
- Discuss a possible public-private collaboration project for 2015-2016

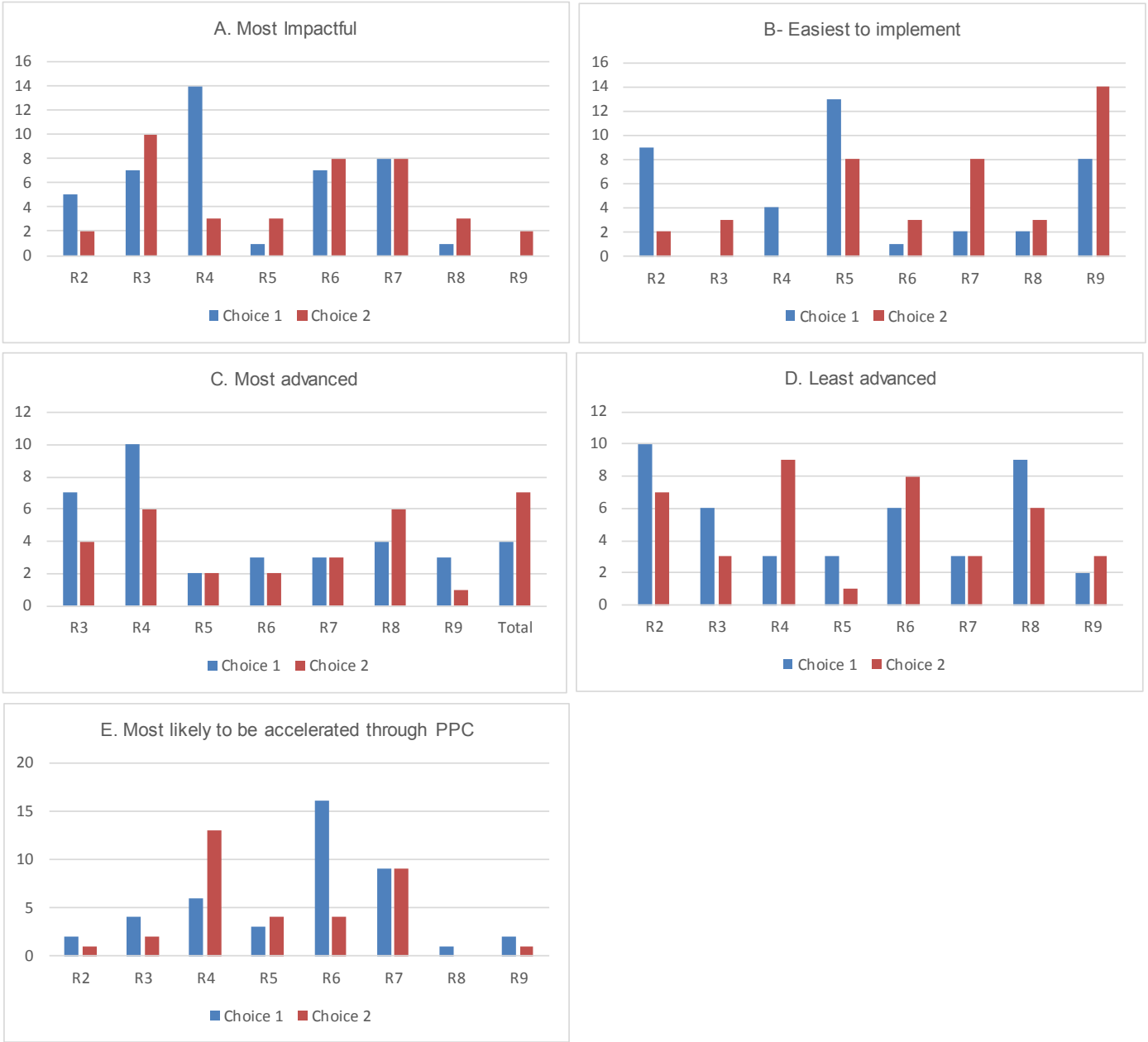
Assessment results

During the kick-off workshop, participants individually assessed eight recommendations and selected a first and second choice for implementation (Figure 2). After the initial individual selections, the group agreed on no more than two recommendations that, if implemented, could be accelerated through increased public-private collaboration (PPC).

Selection criteria for recommendations:

A. Most impactful
B. Easiest to implement
C. Most advanced so far
D. Least advanced so far
E. Most likely to be accelerated through public-private collaboration

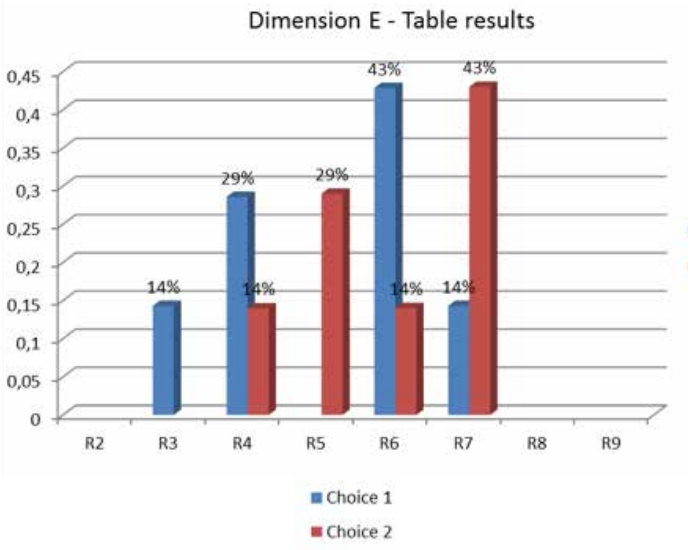
Figure 2: Kick-Off Workshop – Individual Assessment Results
Number of votes per recommendation



Note: R = Recommendation (Recommendation 1 was not used during the workshop); PPC = public-private collaboration.
Source: Latin America Competitiveness Lab kick-off workshop, June 2015

According to group discussions, the recommendations most likely to be accelerated through public-private collaboration were No. 6 ("Design public-private research and skills development funding schemes") and No. 7 ("Define and implement cross-sectoral vocational education and training programmes"), as shown in Figure 3.

Figure 3: Kick-Off Workshop – Group Discussion Results



Note: R = Recommendation (Recommendation 1 was not used during the workshop).
Source: Latin America Competitiveness Lab kick-off workshop, June 2015

The relation between the recommendations

These two recommendations provided clear direction for the next stage of the Latin America Competitiveness Lab in Colombia: increase investment rates in innovation and education, identify new potential funding schemes, and align educational and training programmes with industry requirements.

2.1 Developing a work plan to design a public-private funding scheme for innovation

To efficiently design a plan for implementing the selected recommendation, the first step was to identify a business sector that would benefit from the new funding scheme. Within the framework of a public-private collaborative initiative in Colombia, the energy subsector of non-conventional energy sources and energy efficiency (EE) was selected.

The energy sector

Energy is one of the main inputs for industrial production, with cross-border effects. Innovation in this sector, leading to improved quality and costs, will hence have cascading effects throughout the economy.

To drive the sector's evolution, challenges must be transformed into boosters of innovation. These can be technological improvements, better energy distribution or more efficient use of energy. Trends in energy consumption indicate that the world's energy needs may increase by 49% to 2035. In developing countries, such as Colombia, the increase may be up to 84%.

As environmental concerns become more important, renewable energy sources are increasing their share of energy consumption. The substitution of dominant fossil-fuel energy sources by new ones seems to have been dictated by new opportunities from new technologies, rather than by the shortage of traditional energy sources.[2] This is particularly relevant in the context of the Fourth Industrial Revolution, which emphasizes the role of new technologies in transforming production systems.

Currently, all new developments and technologies share a key feature: they leverage the pervasive power of digitalization and information technology. New innovation is made possible, and enhanced, through digital transformation. Gene sequencing, for example, could not happen without progress in computing power and data analytics. Similarly, advanced robots would not exist without artificial intelligence, which itself largely depends on computing power.[3] Energy consumption is one of the main factors of production driving these transformations and determining the capabilities to fully leverage the Fourth Industrial Revolution's benefits.

Energy challenges

According to the International Energy Agency (IEA):

> Governments in most countries face challenges in sustainably developing their energy systems. These challenges include:
>
> – Ensuring adequate supplies of energy in the long term to support economic development
> – Improving security of their energy supplies to reduce dependence on foreign energy sources
> – Providing a healthy, unpolluted environment for their populations
> – Contributing to mitigating global climate change
>
> An important goal in meeting these challenges is to transition from a fossil fuels-based economy to one that is less carbon energy-intensive. The *IEA Energy Technology Perspectives 2010* estimated that the investment required to halve greenhouse gas emissions by 2050 is $46 trillion higher than the baseline scenario for 2010 to 2035.[4] Reducing energy consumption through improved efficiency represents a key strategy in these efforts, because EE provides the most cost-effective solution in the short to medium term for reducing energy demand/the supply gap, enhancing energy security and mitigating local and global environmental impacts.[5]

Energy efficiency

EE is a key factor in reducing energy consumption through changing behavioural, managing energy with better equipment and optimizing the performance of electronic equipment.

Using modern, low-consumption technology and more efficient systems for regulating energy needs could significantly reduce energy consumption in the residential sector. Introducing best practices and educating residential users will drive more efficient energy consumption, tackling the challenges for improving residential energy use. In the industrial sector, new energy management systems are the base for activities that reduce energy consumption levels. Together with more environmentally oriented companies supported by stronger green policies, the improvement will not only affect companies' performance in EE, but also their business cluster's entire value chain.

Recent studies indicate that many barriers exist to implementing EE projects in developing countries. According to the IEA:

> These barriers can be classified into four broad categories:
>
> – Policy and regulatory barriers
> – Barriers related to energy end users (both public and private sectors)
> – Barriers related to providers of energy-using equipment and energy services
> – Financing barriers
>
> Even when the first three barriers have been overcome, financing barriers arise because energy users are generally unwilling to invest their own funds in EE projects; they have many of what they consider to be higher-priority investment options for their funds. Most energy users, including large industrial firms, small and medium enterprises (SMEs), commercial sector energy users and public agencies, therefore, seek external financing for their EE projects. However, banks and financial institutions (referred to as local financial institutions or LFIs) are generally reluctant to provide loans even for highly profitable EE projects because of their lack of knowledge and understanding, and their perception of high risk with respect to EE projects.[6]

The potential for market failures warrants public policy that is jointly designed with the private sector.

The IEA further states:

Among the potential EE investors and EE-supporting industry, SMEs are affected much more by the "disconnect" between the financing needs and the lending practices of LFIs than large industrial firms with substantial balance sheets that can borrow funds with fewer restrictions. Because a substantial portion of EE potential is in SME's, mechanisms must be developed to "scale up" lending to SMEs for the implementation of EE projects on a national and international level. Even large companies, however, are often unwilling to take on additional debt for financing EE projects because of the potential effect on their borrowing capacity for other types of investments. EE investments may sometimes fundamentally change industrial processes with potential risks to the enterprise if the equipment or process does not work as well as expected or excessive downtime occurs. For this reason, the CEO may be looking for a higher IRR [internal rate of return] from projects to compensate for risks.[7]

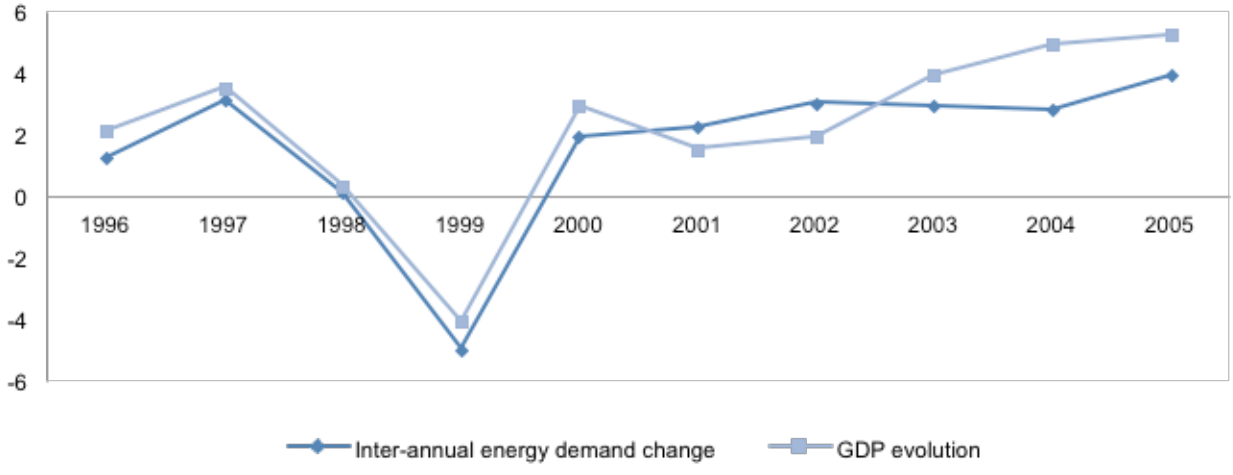
Colombia's energy sector

Background

Colombia is a net exporter of energy, exporting about three times what it consumes. This improves the country's performance in this area, counterbalancing areas such as quality of electricity supply where progress is needed.[8]

Energy consumption in Colombia has been increasing in recent years. The trend in energy demand is closely related to the evolution of its gross domestic product (GDP) (Figure 4), an indicator of the country's energy needs considering the projection of GDP growth in the coming years.

Figure 4: Colombia's GDP and Energy Demand, Inter-Annual Change

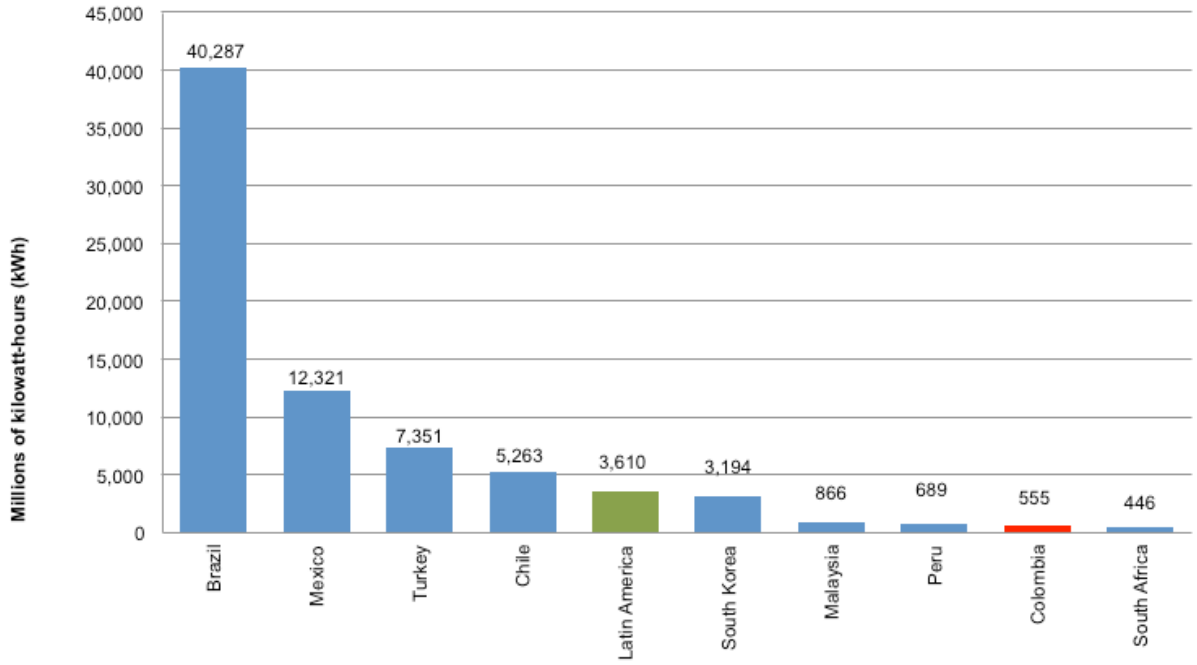


Source: Mining and Energy Planning Unit, Ministry of Mines and Energy of Colombia

Non-conventional energy sources

Use of non-conventional energy sources (NCESs) is still very low in Colombia. The energy generated from NCESs is barely 15% of the amount generated by the average Latin American country, and well below reference countries such as Brazil, Mexico and Turkey (Figure 5).

Figure 5: Energy Generated from Non-Hydric Renewable Sources, Colombia vs Reference Countries, 2012



Source: US Energy Information Administration; includes geothermic, eolic, solar and oceanic energy generation, as well as biomass

Considered within Colombia's NDP 2014-2018, NCESs are seen as a real opportunity to diversify sources for generating electric energy. This is in line with recommendations from the Organisation for Economic Co-operation and Development (OECD) about the value of energy solutions with very low environmental impact. The goals as set in the NDP 2014-2018 are shown in Figure 6.

Figure 6: Goals for Non-Conventional Energy Sources, Established in Colombia's NDP 2014-2018

Indicator	Baseline 2013 (MW)	Goal 2018 (MW)
Non-conventional and renewable energy sources: installed capacity within the national energy system	10.0	11.1
Non-conventional energy sources: installed capacity in non-interconnected zones	2.8	9.0
Hybrid energy-generation projects implemented with over 1 megawatt (MW) of installed capacity	0	4.0

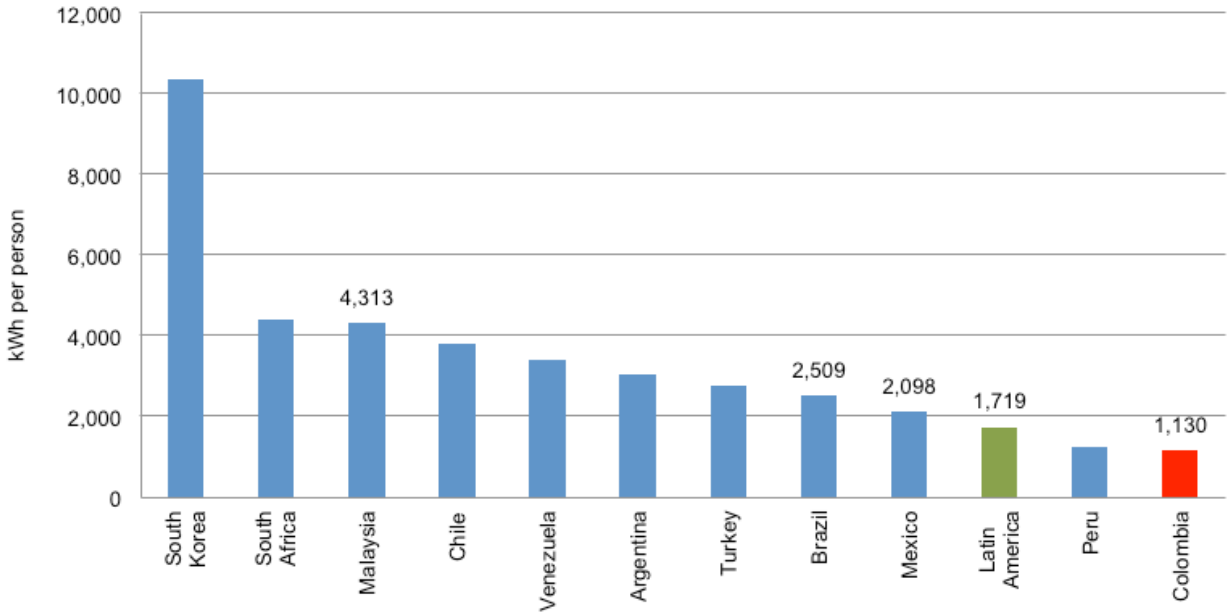
Source: Private Competitiveness Council of Colombia, based on Colombia's NDP 2014-2018

Energy consumption

Colombia is facing two challenges in energy consumption:

1) Strengthening the development of energy-intensive production: Higher energy consumption is associated with greater sophistication of the production system. Colombia lags the average for Latin American countries and is significantly behind other reference countries (Figure 7).

Figure 7: Consumption of Electric Energy per Person in kWh: Colombia vs Reference Countries, 2012



Source: International Energy Agency, Statistics (see http://www.iea.org/statistics/)

2) Implementing policies for EE: the Mining and Energy Planning Unit (UPME) of the Ministry of Mines and Energy of Colombia has estimated the cost of energy waste in Colombia to be about $5.2 billion per year (1.3% of GDP).

In response to this challenge, the Ministry of Mines and Energy is structuring a fund for non-conventional energies and efficient energy management (FENOGE), with available funding of about $7 million-8 million. Colciencias also implemented programmes for funding non-conventional energy sources and EE projects, supported by funding from the National Royalties System.

Another effort for supporting advances in this area is the STI Programme for Sustainable Energy Development in Colombia,[9] where strategies and specific actions have been defined, and non-conventional energy sources and EE technologies reviewed. In addition, heat and energy generation from renewable sources was also a key issue in the plan, where EE was defined as the basis for improving levels of energy use.[10]

Colombia's challenge to improve energy efficiency

The benefits of improved EE have been demonstrated and are generally accepted. However, the process of designing, financing and implementing EE initiatives has proved challenging, especially considering the financial barriers for funding such projects.

In response to Colombia's challenge, the Competitiveness Lab seeks to galvanize efforts to increase the financing of innovation projects that concern the country's energy efficiency. The goal is to improve the efficiency of energy consumption in the industrial sector. This report will illustrate a possible financing model for the Colombian case, which can be incorporated into the National Competitiveness Agenda and leverage policy initiatives in the energy and STI sectors.

2.2 Funding scheme for innovation projects in energy efficiency

Rather than generating new revenues, EE projects are normally oriented towards saving costs relative to a baseline (i.e. the cost of using energy in the absence of the EE project). However, this could be a reason why financial institutions may have difficulty defining a baseline, and measuring and verifying the savings relative to it, as well as assuring that EE savings are dedicated to servicing debt. These challenges may make financial institutions reluctant to finance EE projects. Also, transaction costs may constrain access to commercial financing for EE projects, especially for SMEs.

The public sector and policy can play a role in solving market and coordination failures, and ensuring the availability of funding for EE projects by sharing the financial risk with the private sector through a guarantee mechanism. In this way, the risk of an EE project may be reduced, which will close the gap between social and private gains. Thereby, it will increase the incentive for private investors to invest in socially desirable EE projects.

Public-private collaboration, as in the government partnering with financial institutions, allows for an initiative to use a public-private partnership (PPP) framework for delivering instruments that tackle EE project barriers, such as those on financing. This allows the government to leverage private-sector expertise to help achieve EE goals in a more efficient way (Figure 8).

Figure 8: Leveraging Private-Sector Expertise for Achieving EE Goals More Efficiently

Resources may be	Skills, knowledge, and capabilities may be	Risks and costs may be	Outputs may be
• Supplemented	• Complemented	• Shared	• Achievable at all
• Leveraged further	• Cross-transferred	• Allocated more efficiently	• Delivered faster
• Utilized more efficiently	• Cross-improved	• Reduced	• With a greater scope
	• Co-developed		• Of higher quality
			• More sustainable

Source: Based on IEA, *Energy Efficiency Governance Handbook*, 2010

Engaging the private sector is important in implementing EE policy and programmes. According to a 2010 IEA report on EE governance, PPPs are *"voluntary efforts in which government and the private sector collaborate to analyse public policy problems and jointly implement solutions … Public-private partnerships work most effectively when they focus on a specific issue or problem (i.e. are programmatic), involve broad engagement with private-sector entities, and include some form of co-financing on technology or concept development or demonstration."*[11] *In 2011, the IEA defined PPPs* as **"mechanisms that use public policies, regulations or financing to leverage private-sector financing for EE projects"**.[12]

Energy efficiency project benefits

EE is recognized as one of the key elements of economic and industrial progress. Policies promoting EE have multiple benefits: EE projects may help reduce energy demand and thus lower greenhouse gas emissions and pollution, generating environmental benefits and stimulating related new business sectors.

In national and international efforts to achieve targets on sustainable development, EE is a major energy resource. This reflects a transformation, on both the supply and demand side, that is giving credence to actions for achieving economic growth even while supporting energy security, competitiveness and environmental sustainability.[13]

The IEA has reviewed studies that highlight how EE measures in industry have been shown to provide businesses with a range of direct benefits besides savings on energy. Such benefits include:

- Lower costs of environmental compliance, maintenance and waste disposal
- Enhanced productivity and competitiveness
- Extended lifetime of equipment
- Improved process and product quality
- Better work conditions and decreased liability

Benefits for emerging economies

As emerging economies and developing countries seek to exploit their base of resources to reduce poverty and support sustainable growth, improved EE provides them with a variety of benefits:[14]

- Access: Energy efficiency can help countries to expand access, enabling them to supply power to more people through existing energy infrastructure.
- Development/growth: Energy efficiency supports economic growth, for example by improving industrial productivity and reducing bills for fuel imports.

- Affordability/poverty alleviation: Energy efficiency can make energy services more affordable for poorer families by reducing the per-unit cost of lighting, heating, refrigeration and other services.
- Local pollution: Energy efficiency (both supply-side and end-use) can help to reduce the need to generate energy – and thus lower associated emissions – while supporting economic growth.
- Climate change resilience: Energy efficiency, by reducing the need for energy infrastructure, reduces the amount of energy assets exposed to extreme weather events.

Possible financial model for funding innovation programmes in energy efficiency

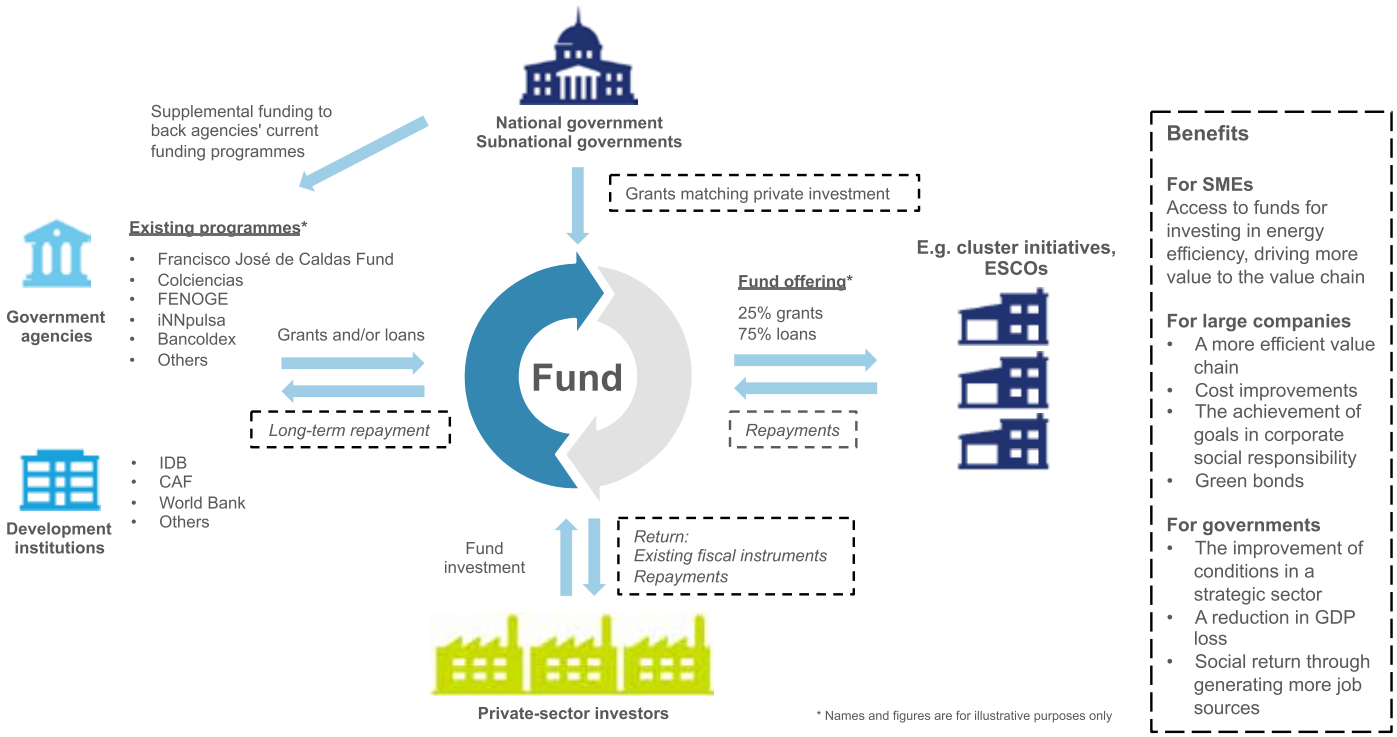
A feasible financing structure for encouraging private-sector investment in EE innovation projects should consider the involvement of key players – from government agencies dealing with innovation and offering associated funding programmes, to the private sector interested in investing to generate a dynamic EE sector, to international development agencies specifically interested in supporting the improvement of strategic sectors with broad impact on productivity.

By developing tools to overcome financing barriers, proper market conditions can be created to ignite EE innovation projects, achieving greater results in diminishing CO_2 emissions and improving competitiveness. Moreover, many economic sectors, such as business, energy-intensive industries and even home users, will benefit from the reduced energy costs of a more efficient energy market. This will generate additional resource savings and returns, with increased profits or savings to be spent elsewhere in the economy.

To build a programme to overcome such barriers, the funding scheme must consider all the stakeholders linked to country's energy sector. It is likewise essential that the scheme be embedded within the country's energy development policies, creating a framework to coordinate and articulate these policies with private-sector needs. By articulating public-private collaborative initiatives, and considering stakeholders' particular interests, the financing scheme should provide an effective response to challenges concerning non-conventional energy sources and EE.

Figure 9 depicts a possible model for a funding scheme that could respond to Colombia's challenges.

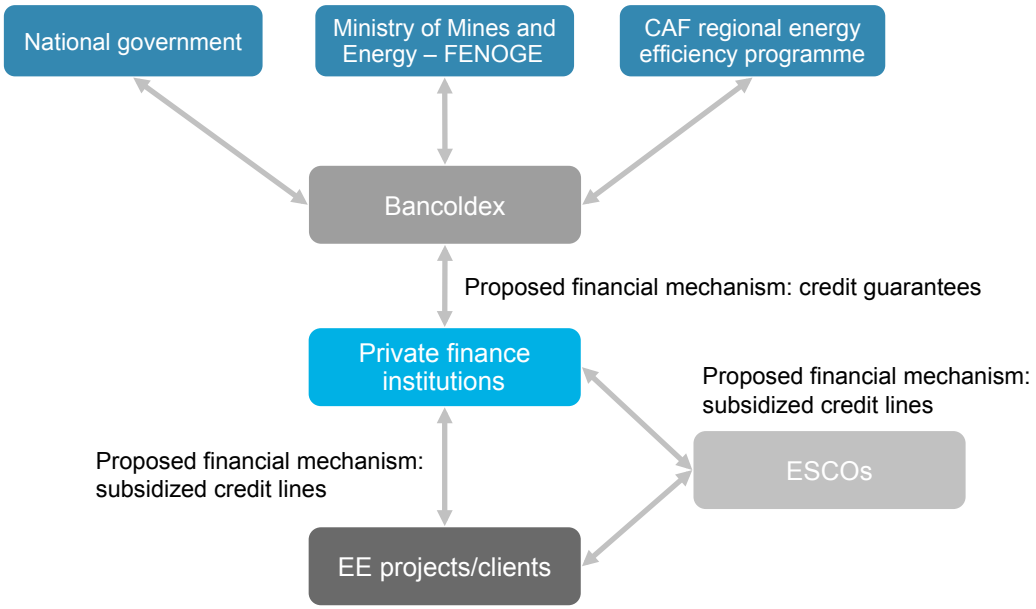
Figure 9: Possible Funding Scheme for Colombia



Source: Colombia Competitiveness Lab Steering Committee and Working Group

To simplify the model, a practical example can illustrate how the funds could be directed (Figure 10).

Figure 10: Simplified Model for Channelling Funds



Source: Colombia Competitiveness Lab Steering Committee and Working Group

One way to implement the proposed financing strategy is to structure a specialized credit facility through Bancoldex, the Colombian foreign trade bank. The credit line would serve to channel funds from the national government, international and regional development banks and existing funds into a special fund within Bancoldex dedicated to subsidize loans for innovation in EE. The government may provide additional funds through savings from energy subsidies generated through EE. To determine these, objective and neutral third parties must carry out the impact evaluations required to estimate the savings.

Bancoldex will offer these funds for credit lines opened by commercial banks dedicated exclusively to EE projects presented by industrial clusters. Eligible projects must be proposed by an organized cluster or a firm with a value chain proposition, or by an energy service company (ESCO) with an innovative proposition.

Objectives or output

The expected output of the proposed funding scheme is to promote accessible options for financing innovative EE projects. Another goal for this funding scheme is to become the tool for articulating public-sector interests with those of the private sector, thus setting the conditions for public-private collaborative initiatives in innovative EE investments.

This scheme intends to establish the framework for articulating EE-project funding programmes, already on the market, with new programmes or credit lines. Existing programmes belong to different government agencies, such as Colciencias (Francisco José de Caldas Fund); iNNpulsa, the government agency that supports and promotes business hypergrowth led by innovation; or FENOGE from the Ministry of Mines and Energy. New programmes could be supported by international development institutions, such as the Inter-American Development Bank (IDB), the Development Bank of Latin America (CAF) or the World Bank, among others.

Funding scheme players

Public sector

National government

Through its ministries, the Colombian government has an active role in designing policies to encourage strategic sector development. For a successful funding scheme, the following bodies should play a central role during the entire funding design process and its implementation:

- Ministry of Commerce, Industry and Tourism
- Ministry of Finance
- Deputy Ministry of Mines and Energy of Colombia
- Office of the Presidential Adviser, National System of Competitiveness, Science, Technology and Innovation
- National Planning Department
- Financial Superintendence

Government agencies

Innovation-related government agencies will play a key role in shaping the funding scheme, as they currently support innovation development in Colombia through

many programmes funded exclusively by the public sector. The agencies all run financing programmes and several initiatives at the same time, in response to the strategic guidelines established for fulfilling the Colombian government's objectives. These agencies include Colciencias (STI administrative department), iNNpulsa and Bancoldex.

Development institutions

International development institutions provide financing and professional advice through development banks to support projects, typically in emerging markets. They often support specific areas through technical and financial assistance. Development banks may provide financing through long-term or very long-term loans, with varying rates (market or below-market). The assistance may also be through grants for some specific opportunities.

This support is often provided to national governments, being channelled through government agencies responsible for managing and coordinating financial programmes for EE projects, as well as for determining eligibility conditions and requirements for implementation. The Ministry of Mines and Energy, as well as Colciencias, must play an active role in defining eligibility criteria and evaluating proposed projects.

Available financing portfolio

Inter-American Development Bank

The IDB helps member countries improve the coverage and quality of energy services. Its goal for the energy sector in Latin America is to help the region's countries increase access to more efficient, affordable, sustainable and reliable energy. The IDB supports financing programmes to improve EE, among others, with an actual portfolio of approximately $100 billion invested on such projects in Latin America.[15]

World Bank

Playing an active role in the region by financing different energy projects, the World Bank Group provided over $48 billion worldwide for energy projects in 2008-2014, with almost one-third of that amount going to EE, transmission and distribution projects.[16]

CAF

The Development Bank of Latin America supports a regional collaborative agenda for the development of sustainable energy systems in the region. Its Regional Energy Efficiency Program (PREE) intends to encourage energy savings on both sides of the energy market, namely in demand and supply. The programme has three instruments:

- A financing programme for energy generation and distribution (supply side)
- A financing programme for EE projects (demand side)
- A technical assistance fund for identifying, structuring and monitoring EE projects

Private sector

Potential investors

Financial institutions

Within the financial system, institutional categories play different roles depending on their structure and commercial objectives. Private financial institutions will play a major role in supporting the proposed funding scheme by providing more capital funds than are currently available, complementing public-sector contributions and increasing the overall availability for funding. The public sector's role will be critical in generating attractive conditions for private commercial banks, local private investment banks and investment companies, thus ensuring their interest and participation. Potential private institutions for funding are Bancolombia, Grupo Aval, Colpatria, Davivienda and Financiera de Desarrollo Nacional.

Large private companies

Private companies, another potential source of funding, are interested in improving the competitiveness and productive conditions of participants in their value chains, and would also benefit from the value so generated.

Potential beneficiaries

Energy service companies

ESCOs, generally private companies that develop and implement EE projects, have service portfolios that may run from energy saving and opportunity identification to technical advice and final project implementation. Normally, these companies share technical risk with their clients through specific types of contracts, known as energy services performance contracts (ESPCs). The ESCOs also perform impact evaluations, and can evaluate EE programmes to calculate savings in government subsidy programmes. ESCOs are not capable financially to fund EE projects themselves, but can be considered as key players in channelling funding programmes to EE-project clients and presenting projects on behalf of clients to the financing scheme.

EE-project clients

As the final beneficiaries of EE projects, these clients (companies) could implement such projects on their own or ask for the ESCO's assistance, given the type of project, company size and technical capabilities. They are targets for the funding programmes considered under the proposed funding scheme.

To be eligible to access such programmes for EE projects, interested companies must link to a cluster initiative in Colombia. Cluster initiatives are projects organized for promoting collaboration between different players from the public and private sectors, with the objective of encouraging the cluster's economic development within a region by improving productivity and competitiveness. Examples of Colombian cluster initiatives include the Rutas Competitivas programme, developed by iNNpulsa together with local business chambers of commerce and associations, where specific projects and roadmaps are built to stimulate regional productivity-enhancing plans.

Designing the financing fund for EE innovation projects

The proposed financing fund is expected to lend funds directly to eligible EE innovation projects, supplementing actual programmes from government agencies. According to this proposal, it will also become an instrument for channelling funds for different types of EE-related projects, such as:

- Development of innovative EE technology and renewable energy-source technologies (innovation investment-oriented)
- Public and private building retrofits, incorporating innovative insulation and/or coating technologies related to EE solutions
- Combined heat and power EE investments, considering cooling/heating innovative technologies as well
- Infrastructure energy improvement, considering efficient lighting (for private facilities, outdoor public places) and efficient electricity storage solutions that will benefit from innovations in information and communications technology (ICT)

To channel funds for EE innovation projects, it is important to determine the most appropriate and most efficient mechanisms for achieving the highest possible coverage.

Financing mechanisms

Several factors determine the suitability of possible financing mechanisms: the strength of the national or subnational government's financing capabilities, the willingness of the private commercial financing community to participate, and the support level and availability of funds from international development institutions (Figure 9), for example those with an active presence in Latin America, such as the IDB, CAF and World Bank. The potential range of financing mechanisms that could be applied will depend on the complexity and type of projects the funding programmes support, and must be aligned to tackle specific EE project challenges.

To deal with the higher risk perceived by private financial institutions, the Colombian government may offer credit guarantees to help mitigate the level of risk, supporting private banks to offer better funding conditions. These guarantees may cover part of the investment based on the project risk assessments, lowering interest rates and granting accessibility to potential beneficiaries. They could be implemented through financial institutions (Figure 10) operating as second-floor banks (e.g. Bancoldex), providing guarantees on loans to borrowers' banks by covering a share of the loans' risk.

Governance

One of the most important elements of implementing a financing project is how the steering board will be convened. The criteria for the board include:

Flexibility: to move from specific segment or project type within the business sector, allowing to commercialize funding programmes and settle specific agreements according to best practice and legal feasibility

Independence: to ensure more effective and efficient decisions for leveraging private-sector commitment and involvement

Accountability: to set proper accountability procedures, thus ensuring more effective communication with stakeholders (it may be stronger when performance-indicator metrics are established from the beginning, allowing for proper performance assessment and comparison with expected results)

Programme administrators: to assign one administrator responsible for a particular funding programme (i.e. keeping administrators focused on one specific area), thus making the accountability process more effective in achieving programme objectives

2.3 Funding scheme design: work plan

This report provides a guide or work plan for designing the funding scheme and addressing the main barrier identified for EE projects, namely the lack of funding. This work plan was developed based on the Colombian experience, considering the analysis and studies performed by the project's Working Group and Steering Committee.

The work plan for designing the funding scheme consists of two chapters (Figure 11):

- Chapter 1 provides the steps for a basic design that will allow the project development team to identify a business sector to focus on, to understand its challenges and to validate them with private-sector players.
- Chapter 2 focuses on the project development team understanding the local financial landscape and identifying potential investors for defining the scope of the funding scheme, as well as assessing its legal feasibility. This can set the basis for structuring the financing scheme, and for designing the financial vehicle and the accountability parameters for monitoring performance.

Implementing a pilot (Chapter 3) to articulate and test the design efforts is covered below following the review of Chapter 2 activities.

Figure 11: Funding Scheme Design – Work Plan Chapters and Estimated Duration

Task Name	Estimated Duration (days)
Funding scheme design: work plan	**285**
Chapter 1 – Basic design	**150**
1. Select the business sector	25
2. Diagnose the strategic sector	40
3. Define objectives and the target	20
4. Validate the strategic sector's key private players	20
Chapter 2 – Advanced design	**135**
5. Involve potential private-sector investors	45
6. Define the funding scheme's scope	10
7. Determine financing mechanisms	70
8. Assess legal feasibility	30
9. Identify funding sources	30
Financing scheme structuring	**40**
10. Design the fund	40
11. Set the parameters of the scheme's accountability	40
12. Develop the marketing and communications plan	40

Note: The numbered Chapter 2 tasks may overlap and are accomplished within the chapter's estimated duration of 135 days.
Source: Colombia Competitiveness Lab Steering Committee and Working Group

Chapter 1 – Basic design

In Chapter 1, the main activities help to identify strategic sectors of the economy which may be eligible to receive assistance from funding programmes.

Task 1. Select the business sector

This task includes the following activities:

Task and ActivitieS	Estimated Duration (days)
1. Select the business sector	25
1.1 Survey strategic sectors	
1.2 Identify strategic sectors	
1.3 Assess strategic sectors	
1.4 Select and validate strategic sectors	
Milestone: Strategic sector selected and validated	

Selecting a business sector may involve the following: compliance with specific requirements that ensures its alignment with national development policies, the potential benefits from implementing EE projects, the business sector's growth potential and the related value chain, among others.

The process begins with a survey of the most relevant business sectors, acknowledged to be of strategic interest for the country by either the NDP 2014-2018, the Mining and Energy STI Strategic Plan, the STI CONPES document or the productive development policy CONPES document. After identifying potential sectors, an eligibility assessment is performed to understand which have the greatest impact and which will create higher value, in economic and social terms. This will provide a ranking of potential sectors from which one will be selected. For Colombia, and after assessing the different strategic sectors, the non-conventional energy sources and EE subsector was selected.

Key actors identified: Colciencias; National Association of Entrepreneurs of Colombia (ANDI); National System of Competitiveness, Science, Technology and Innovation; National Planning Department; Competitiveness Private Council; iNNpulsa; Ministry of Commerce, Industry and Tourism; ProColombia; Productive Transformation Program (PTP)

Task 2: Diagnose the strategic sector

This task includes the following activities:

Task and ActivitieS	Estimated Duration (days)
2. Diagnose the strategic sector	40
2.1 Analyse the sector's access to financing	
2.2 Assess the sector's challenges	
2.3 Identify opportunities	
2.3.1 Identify needs to be addressed by funding scheme	
2.3.2 Identify opportunities for financing	
2.4 Develop the sector (based on diagnosis)	
Milestone: Strategic sector diagnosed	

Once a strategic sector is identified and selected, the next step will be to explore and understand the sector's challenges. This analysis may consider the ease of access to financing in the selected business sector, existing funding programmes, requirements for qualifying for these programmes, the number of applications submitted, and how many were approved and rejected, and why. Based on the outcome of this analysis, the project team can understand the main needs that the funding scheme should address.

In Colombia, the challenge of EE has so far been quantified by the UPME, with the cost of energy waste estimated to represent 1.3% of the nation's GDP ($5.2 billion) per year.

Key actors identified: Colciencias; ANDI; National System of Competitiveness, Science, Technology and Innovation; National Planning Department; Competitiveness Private Council; iNNpulsa; Ministry of Commerce, Industry and Tourism; ProColombia; PTP; Ministry of Mines and Energy

Task 3: Define objectives and the target

This task includes the following activities:

Task and Activities	Estimated Duration (days)
3. Define objectives and the target	20
3.1 Set financing scheme objectives	
3.2 Define the investment's expected outcome(s)	
3.2.1 Short-term impact	
3.2.2 Medium-term impact	
3.2.3 Long-term impact	
3.3 Develop the objectives, targets and expected outcome report	
Milestone: Objectives, targets and expected outcome defined	

The diagnosis of the strategic business sector will allow for setting the financing programme's objectives and goals. Establishing the right goals is critical for understanding the programme's expected short-, medium- and long-term returns. The objectives must consider a specific set of target areas for funding, as described in Chapter 2.

Key actors identified: Colciencias; ANDI; National System of Competitiveness, Science, Technology and Innovation; National Planning Department; Competitiveness Private Council; iNNpulsa; Ministry of Commerce, Industry and Tourism; ProColombia; PTP; Ministry of Mines and Energy

Task 4: Validate the strategic sector's key private players

This task includes the following activities:

Task and Activities	Estimated Duration (days)
4. Validate the strategic sector's key private players	20
4.1 Identify the key private-sector players for the validation process	
4.2 Implement the validation process	
4.3 Develop the private-sector validation process report	
Milestone: Private-sector diagnosis completed and objectives report validated	

of potential private-sector beneficiaries is central to designing the financing scheme. This not only responds to the real needs of the business sector, but also ensures any underlying problems are dealt with. The validation process may include key players from Colombia's energy sector, such as:

- National Association of Energy Generation Companies (ANDEG)
- Association of Electricity Generators of Colombia (ACOLGEN)
- Association of Electric Energy Distributors of Colombia (ASCODIS)
- Regional Commission for Energy Integration, Colombian branch (CIER)
- National Association of Entrepreneurs of Colombia (ANDI) – Chamber of Large Energy and Gas Consumers

Key actors identified: Colciencias; ANDI, National System of Competitiveness, Science, Technology and Innovation; National Planning Department; Ministry of Commerce, Industry and Tourism; PTP; Ministry of Mines and Energy; key private-sector players

Chapter 2 – Advanced design

The work plan's second chapter focuses on understanding the complexity of the local financial market, and identifying potential investors and funding sources for setting the funding scheme's scope. To ensure feasibility, compliance with the local legal framework is also checked in this stage.

Task 5: Involve potential private-sector investors

This task includes the following activities:

Task and Activities	Estimated Duration (days)
5. Involve potential private-sector investors	45
5.1. Identify key potential private-sector investors	
5.2. Select investors	
5.3. Validate the private sector's value proposition for the funding scheme	
5.4. Get agreement and commitment from private-sector investors	
Milestone: Potential private-sector investors' commitment secured	

Identifying potential investors for the funding scheme is a crucial activity. In addition, it will provide a comprehensive understanding of the local financial system's complexity and indicate the willingness of major local players to participate. The target audience for this process consists of Colombian private financial institutions, such as Bancolombia, Financiera de Desarrollo Nacional and Grupo Aval, among others.

Key actors identified: National System of Competitiveness, Science, Technology and Innovation; Ministry of Commerce, Industry and Tourism; Bancoldex; iNNpulsa, Ministry of Mines and Energy; PTP

Task 6: Define the funding scheme's scope

This task includes the following activities:

Task and Activities	Estimated Duration (days)
6. Define the funding scheme's scope	10
6.1 Define the scope	
Milestone: Funding scheme's scope defined	

Defining the scope of the funding scheme requires not only setting the conditions, rules and requirements for its implementation, but also taking stakeholders' interests into account. The scope will set basic rules for the financial instruments that may apply to the model and for the role of each stakeholder in the financing process, as well as consider primary objectives and expected results for the funding scheme. Setting realistic returns may respond to stakeholder expectations and provide clear metrics for performance indicators. The scope must be consistent with all the stakeholders' objectives and goals, provide a framework for developing financing programmes, and be strictly aligned with regulatory legislation.

Key actors identified: National System of Competitiveness, Science, Technology and Innovation; Ministry of Commerce, Industry and Tourism; Bancoldex; iNNpulsa; Ministry of Mines and Energy; PTP

Task 7: Determine financing mechanisms

This task includes the following activities:

Task and Activities	Estimated Duration (days)
7. Determine financing mechanisms	70
7.1 Survey available funding mechanisms	
7.1.1 Survey public-sector funding mechanisms	
7.1.2 Survey private-sector funding mechanisms	

7.2 Assess the identified funding mechanisms and their relevance	
7.2.1 Analyse requirements for qualifying for funding programmes	
7.2.2 Analyse approval level of submitted applications	
7.2.3 Analyse loans granted and implemented	
7.3 Develop proposal for financing mechanisms	
7.3.1 Assess and improve development of actual programmes	
7.3.2 Assess and develop “innovative financing mechanisms”	
7.3.3 Develop report of proposal for financing mechanisms	
Milestone: Financing mechanisms proposed	

Identifying the proper financing mechanisms to apply to the proposed funding scheme is central to tackling the perceived risk of EE projects by the private financial sector. To help determine those mechanisms, an understanding of the current ones applied by development and commercial banks in Colombia can provide a wider knowledge of what has worked successfully in the financial market.

Credit guarantees, as well as savings from energy subsidies, may be possible options for the government to generate attractive conditions for involving private financing institutions. Channelling public funds through second-floor banks could be the path to introducing these guarantees, considering not only development banks exclusively owned by the government (e.g. Bancoldex), but also development banks with mixed shareholders, such as Financiera de Desarollo Nacional.

Key actors identified: Bancoldex, iNNpulsa, Asobancaria, representatives from identified private financial institutions

Task 8: Assess legal feasibility

This task includes the following activities:

Task and Activities	Estimated Duration (days)
8. Assess legal feasibility	30
8.1 Gather data on related legal normativity	
8.2 Assess compliance on normativity	
8.3 Validate with government agencies and private sector	
8.4 Decide on developing legal feasibility report	
Milestone: Legal feasibility determined	

Because financial products and services are defined broadly, compliance with the regulatory framework is a necessary condition for developing the funding scheme. A legal viability analysis should be conducted to ensure that stakeholder interests are considered and that they comply with the regulatory framework, ensuring that funding scheme’s proposed design is legally feasible.

Feasibility will be defined by assessing if all definitions achieved in previous steps of the scheme design work plan comply with the Colombian financial sector’s legal framework. Competent legal authorities should perform the review, as this scheme implies public-sector involvement, such as the Financial Regulation Unit of the Ministry of Finance or the Financial Superintendence. The laws regulating Colombia’s current financial system are Law 45/1990, Law 35/1993, Law 454/1998, Law 510/1999, Law 546/1999, Law 795/2003 and Law 795/200.

Key actors identified: Bancoldex, iNNpulsa, Asobancaria, representatives from identified private financial institutions, Financial Regulation Unit of the Ministry of Finance, Financial Superintendence

Task 9: Identify funding sources

This task includes the following activities:

Task and Activities	Estimated Duration (days)
9. Identify funding sources	30
9.1 Gather data on potential sources	
9.1.1 Gather data on public-sector sources	
9.1.2 Gather data on private-sector funding sources	
9.1.3 Gather data on multilateral credit agency funding sources	
9.2 Assess potential funding sources	
9.2.1 Analyse public-sector funding sources	
9.2.2 Analyse private-sector funding sources	
9.2.3 Analyse multilateral credit agency funding sources	
9.3 Develop proposal and report on potential funding sources	
Milestone: Potential funding sources proposed	

To identify potential funding sources, the project team conducts a thorough analysis of available programmes within international development institutions, such as the IDB, World Bank or other regional development organizations, as well as in the Colombian financial market. In addition, potential funding sources identified in the public sector may use funds currently allocated to other funding programmes and consolidating instruments. Other potential financing mechanisms include social impact bonds, certificates and credit guarantees.

Key actors identified: Bancoldex, iNNpulsa, Asobancaria, representatives from identified private financial institutions, National Planning Department, Ministry of Finance of Colombia

Task 10: Design the fund

This task includes the following activities:

Task and Activities	Estimated Duration (days)
10. Design the fund	40
10.1 Establish criteria for the project's selection	
10.2 Define the fund's structure	
10.3 Forecast the cash flow	
10.4 Define key performance indicators	
10.5 Develop the business case model	
Milestone: Fund structure modelled	

The design of the fund's structure will define the type of projects it will support. This helps to assess its financial viability while considering the cash-flow forecast. Defining the proper key performance indicators will set the basis for monitoring fund performance along its life cycle. All of these aspects will be considered for developing the business case, which will reflect the definitions governing the fund's implementation.

Key actors identified: Bancoldex, iNNpulsa, representatives from identified private financial institutions, Ministry of Finance of Colombia

Task 11: Set the parameters of the scheme's accountability

This task includes the following activities:

Task and Activities	Estimated Duration (days)
11. Set the parameters of the scheme's accountability	40 days
11.1 Define the accountability process	
11.2 Validate the accountability process	
11.3 Set control metrics	
11.4 Design indicators for monitoring projects	
11.5 Validate dashboard indicators	
Milestone: Accountability process and control dashboard established	

Programme managers tend to be more effective when they are accountable for their tasks. Keeping close control of performance will allow these managers to recognize deviations from the plan and make corrections to achieve objectives. The governance board can track the funding programmes' performance through control dashboards.

Main indicators should consider the number of applications submitted per programme, the number of applications approved or the turnover in accounts receivable.

Key actors identified: Funding-scheme governance board members

Task 12: Develop the marketing and communications plan

This task includes the following activities:

Task and Activities	Estimated Duration (days)
12. Develop the marketing and communications plan	40
12.1 Identify communications target and secondary target	
12.2 Develop communications strategy and media plan	
12.3 Develop communications material	
12.4 Implement communications campaign	
12.5 Design control metrics	
Milestone: Communication plan developed and implemented	

The difference between success and failure of the whole effort can come down to communicating the existence of the funding programme. To ensure success, the communications plan must identify the right target. The plan's strategy and implementation should revolve around topics that consider not only funding programmes, but the benefits of EE projects and the potential impact for companies and the sector's competitiveness. For a more effective implementation, it is strongly recommended to leverage any communications effort with activity undertaken by the Ministry of Mines and Energy, as well as other related agencies and institutions.

Key actors identified: Funding-scheme governance board members, Ministry of Mines and Energy, Bancoldex, related agencies or institutions

Chapter 3 – Pilot implementation: strategy and progress

Several good opportunities exist to implement and articulate these efforts, and to propose a pilot for the financing scheme. They are the Ministry of Energy's new comprehensive energy policy, as well as new initiatives by UPME and the PTP. This pilot exercise would entail:

1. Implementing the new EE policy in Colombia
2. On-boarding the PTP, UPME, ESCOs and the ANDI Chamber of Large Energy and Gas Consumers, and identifying collaboration and synergies between the Competitiveness Lab's output and existing initiatives
3. Collaborating more deeply with the Ministry of Energy
4. Identifying new sources of financing from international organizations and international cooperation

Recent Initiatives

The following are international efforts to collaborate on initiatives:

1. **Energy Efficiency Certification Program** ($2.5 million): Administered by the United Nations Development Programme, and implementing the Labelling Technical Regulations (RETIQ) EE certification programme, it is instrumental to the requirements for evaluation, verification and information, and can lead to project evaluation and verification.
   See www.etiquetaenergetica.gov.co.

2. **Industrial Energy Efficiency Program** ($2 million): A project of the United Nations Industrial Development Organization and UPME, it seeks to implement technical norm NTC-ISO-50001 and train 200 managers and 50 ESCOs with 75 specialists in EE for cauldrons.

3. **Project preparation facility** ($800,000): A joint initiative of the U.S. Agency for International Development and UPME, it aims to improve the structure and presentation of EE projects.

4. **Tax benefits for EE programmes:** Policy document CONPES 3834 (2015) allowed firms to apply for tax benefits for investments in innovation-based projects. The mechanisms in this policy can be used to further encourage investments in EE projects within the presented framework. See https://colaboracion.dnp.gov.co/CDT/Conpes/Econ%C3%B3micos/3834.pdf.

Innovation-related projects

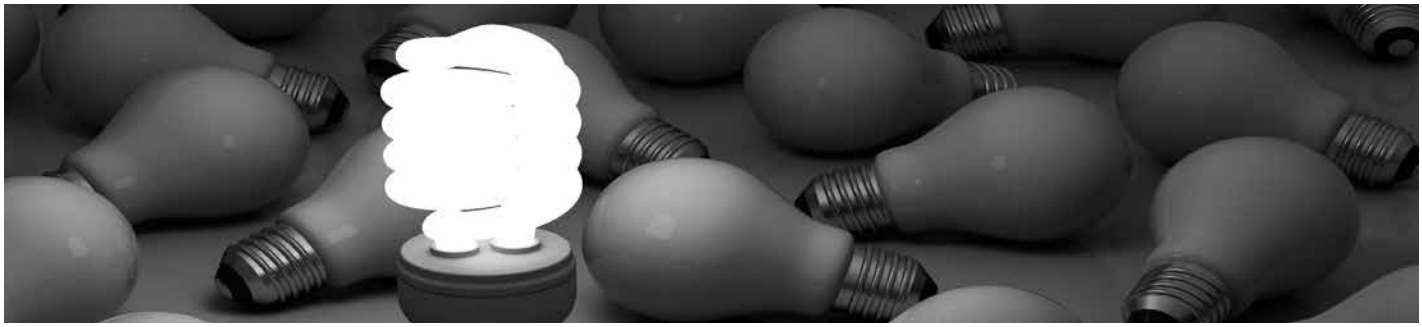
One of the Competitiveness Lab's key contributions is to make innovation an imperative on the EE agenda and highlight the need for public-private funding. A specific industrial sector must be selected to create a pilot for assessing impact.

Pilot programme

The pilot's implementation will be coordinated within the competitiveness agenda and used under the PINES system (projects of national strategic interest), in coordination with all actors in the National Competitiveness System.

International Case Studies

Case studies provide good examples of what has been done in other countries with similar challenges, and the lessons learned. While the private sector gives low priority to EE innovation projects, the public sector, through related government agencies, may promote programmes for supporting such projects by designing instruments to mobilize private-sector investments. Here are valuable examples and success stories taken directly from the sources mentioned:



Horizon 2020 – Secure, Clean and Efficient Energy

To make the transition to a competitive energy system, a number of challenges must be overcome, such as increasingly scarce resources, growing energy needs and climate change. The Energy Challenge, within the European Union's Horizon 2020 programme, is structured around seven specific objectives and research areas:

- Reducing energy consumption and the carbon footprint
- Low-cost, low-carbon electricity supply
- Alternative fuels and mobile energy sources
- A single, smart European electricity grid
- New knowledge and technologies
- Robust decision-making and public engagement
- Market uptake of energy and ICT innovation

A budget of €5,931 million has been allocated to non-nuclear energy research for the period 2014-2020. Out of this figure, more than €200 million is earmarked to support European Institute of Innovation and Technology activities, subject to a mid-term review.

Main priorities

Energy efficiency
Energy efficiency is a no-regret option for Europe, addressed by both short-term and long-term EU policies. The EU is aiming to progressively decrease primary energy consumption by 2020 and 2030. Research and demonstration activities within this area will focus on buildings, industry, heating and cooling, SMEs and energy-related products and services, integration of ICT and cooperation with the telecom sector.

Low-carbon technologies
It is important to develop and bring to market affordable, cost-effective and resource-efficient technology solutions to decarbonize the energy system in a sustainable way, secure energy supply and complete the energy internal market. Research activities within this area will cover: photovoltaics, concentrated solar power, wind energy, ocean energy, hydropower, geothermal energy, renewable heating and cooling, energy storage, biofuels and alternative fuels, carbon capture and storage.

Smart cities and communities
Sustainable development of urban areas is a challenge of key importance. It requires new, efficient and user-friendly technologies and services, in particular in the areas of energy, transport and ICT. However, these solutions need integrated approaches, both in research and development of advanced technological solutions, as well as in deployment. The focus on smart cities technologies will result in commercial-scale solutions with a high market potential.

Source: European Commission, Horizon 2020, "Secure, Clean and Efficient Energy" [undated], at https://ec.europa.eu/programmes/horizon2020/en/h2020-section/secure-clean-and-efficient-energy

European Energy Efficiency Fund

The European Energy Efficiency Fund (eeef) is an innovative public-private partnership dedicated to mitigating climate change through energy efficiency measures and the use of renewable energy in the member states of the European Union. It focuses on financing energy efficiency, small-scale renewable energy and clean urban transport projects (at market rates), targeting municipal, local and regional authorities and public and private entities acting on behalf of those authorities.

Fund structure

The eeef is a public-private partnership open to investments from institutional investors, professional investors and other well-informed investors within the meaning of the Luxembourg SIF [specialized investment fund] law. In particular, targeted investors are donor agencies, governments, international financial institutions and professional private investors.

Eligible investments

The eeef targets investments in the member states of the European Union. The final beneficiaries of eeef are municipal, local and regional authorities as well as public and private entities acting on behalf of those authorities, such as utilities, public transportation providers, social housing associations, energy service companies, etc. To reach its final beneficiaries, eeef can pursue two types of investments:

Direct investments

These comprise projects from project developers, ESCOs, and small-scale renewable energy and energy efficiency service and supply companies that serve energy efficiency and renewable energy markets in the target countries.

Investments into financial institutions

These include investments in local commercial banks, leasing companies and other selected financial institutions that either finance or are committed to financing projects of the final beneficiaries, meeting the eligibility criteria of the eeef.

Ongoing programmes and their EE targets, in European countries:

Netherlands

– €8.5 million senior debt to the city of Venlo. Target: public lightning

France

– €7.3 million junior funds to project vehicle to supply heat to the city of Rennes. Target: combined heat and power/biomass
– €30 million senior funding with Bolloré. Target: clean urban transport – electric cars

Germany

– €0.9 million forfeiting loan to Jewish Museum Berlin via ESCO of Johnson Controls. Target: building retrofit

Italy

– €32 million project bond facility to project entity upgrading the University Hospital S. Orsola Malpighi in Bologna. Target: energy reduction in entire fluid production and distribution system

Romania

– €25 million subdebt to Banca Transilvania. Target: financial intermediary investment for EE, RE [renewable energy] and clean transport

Source: European Energy Efficiency Fund, "Current Investments", at http://www.eeef.eu/

Energy Efficiency Loan Guarantees in Bulgaria

The Bulgarian Energy Efficiency Fund (BEEF) was established with support from the World Bank and the Global Environment Facility (GEF), in cooperation with the Governments of Bulgaria and Austria, to support a large increase in EE investments in Bulgaria through development of self-sustaining, market-based financing mechanisms. BEEF offered Partial Credit Guarantees (PCGs) to share in the credit risk of EE finance transactions and to improve loan terms for project sponsors. The PCGs covered potential loan loss claims at up to 70% of the outstanding loan principal (portfolio) of the financial institution, with individual guarantee commitments not to exceed $500,000. During the five-year period of 2005-2010, BEEF entered into 31 guarantee agreements covering some $2 million, triggering an investment volume of $15 million. The resulting lifetime energy savings were 0.02 mtoe, and the greenhouse gas savings at 0.1 mtCO_2e.

Source: World Bank, 2010, as cited in *Financing Municipal Energy Efficiency Projects*, Box 2. Energy Sector Management Assistance Program, Knowledge Series 018/14, 2014, Washington DC: World Bank/ IBRD, at https://www.esmap.org/sites/esmap.org/files/DocumentLibrary/ FINAL_MGN1-Municipal%20Financing_KS18-14_web.pdf

Ann Arbor, Michigan (USA) – Municipal Energy Efficiency Fund

With the establishment of a long-term Municipal Energy Efficiency Fund, the City of Ann Arbor was able to overcome the lack of readily available energy efficiency (EE) financing and to demonstrate that municipal governments can play a leadership role in showcasing the value and benefit of EE to its citizens and communities. Savings estimates for projects completed in 10 years (1998-2008) demonstrate that these projects have cumulatively resulted in almost US$0.86 million in energy cost reductions, 10.7 GWh in energy savings, and approximately 8,000 tonnes of CO2e. These projects have also improved the comfort and appearance of city facilities.

In 1988, Ann Arbor issued a $1.4 million bond to finance various EE projects and retrofits at 30 city facilities. Savings from subprojects supported under the bond convinced the city to sustain its support for EE financing. Thus, once the bond was repaid in 1998, the city chose to retain the annual budget line item for bond repayment (but reduced it by 50% to about US$100,000 each year) for five years to create the initial US$500,000 capital for a municipal EE revolving fund. The Fund provides upfront capital for municipal EE projects, which is difficult for budget entities to mobilize on their own, and then collects 80 percent of the resulting energy cost savings for a period of five years. The Fund does not guarantee savings, but bases its repayments on estimates. This model of payment from savings has helped to motivate facility managers to move forward with the projects while becoming a self-sustaining mechanism (i.e., no additional appropriations are required).

The Fund has financed EE projects in several sectors, including light emitting diode (LED) traffic and pedestrian lights, street light improvements, parking garage lighting, a building-level boiler, two electric vehicles, and rooftop photovoltaic (PV) cells. More importantly, the Fund also demonstrates that EE can pay for itself in the long term. Success stories from projects funded through the Fund are used to create public awareness and motivate citizens and other organizations to adopt EE into their planning and programs. The Fund has been a low-cost mechanism which has been relatively simple to implement, but has yielded substantial impacts which have generated interest from other U.S. cities and municipalities around the world.

Source: Energy Sector Management Assistance Program, “Good Practices in City Energy Efficiency / Ann Arbor, Michigan (USA) – Municipal Energy Efficiency Fund”, at http://www.esmap.org/node/1299

Mexico: A New Financing Mechanism for Innovation

Mexico was the second country earmarked for a Competitiveness Lab. This section describes the kick-off workshop and selection of the recommendation from the Insight Report for implementation. Participants selected the same recommendation chosen in the Colombian case dealing with the design of a new public-private financing mechanism for innovation; this allowed the working group to directly tackle the tasks identified in the project methodology already described. (The full report with the proposed financing scheme is presented in Spanish in a companion document.)

Mexico's path to productivity and competitiveness

For many years, Mexico was characterized by a solid macroeconomic environment with low inflation and an economy geared to international trade, thus increasing its attractiveness as an investment platform. A number of leading companies, primarily in the aerospace and automotive but also in the food and beverage industries, have recently set up operations in Mexico, employing highly trained and skilled workers. However, these companies coexist with other segments of the Mexican economy, which have a high level of informality and low skills, low productivity and technological obsolescence.

A comprehensive competitiveness programme that will improve the skills of the Mexican people is required to fully expand the country's potential and increase its productivity. Strengthening the capabilities and infrastructure for research, development and innovation should be a major policy priority. To counter deficiencies, the Mexican government has taken steps within the National Development Plan (2013-2018) and the Special Program on Science, Technology and Innovation (2014-2018), and through a 20% increase in funds in 2014 for the National Council of Science and Technology (CONACYT). The government has also introduced initiatives to increase the number of jobs in research and the proportion of young researchers in public research institutions. Moreover, its international scholarships programme aims to promote links with global scientific communities.

Another priority is to encourage links between industry and science, which is being done through new incentives to foster cooperation and cofinancing between public research institutions and industry, such as the CONACYT's Programa de Estímulos a la Investigación.

These efforts reflect Mexico's improved ranking in the World Economic Forum's Global Competitiveness Index 2016-2017 (six places higher vs 2015-2016).

Mexico and the World Economic Forum

To support the country's efforts to create conditions for developing innovation, the Forum and Mexico's Secretariat of the Economy conducted a kick-off workshop in Mexico City in November 2015. With major stakeholders in innovation participating, the workshop was co-hosted by Ildefonso Guajardo Villarreal, Secretary of the Economy of Mexico, and Marisol Argueta de Barillas, Head of Latin America, World Economic Forum. Other session panellists included Maria del Rocio Ruiz Chavez, Undersecretary of Competitiveness and Business Regulation of Mexico; Francisco González Díaz, Chief Executive Officer of ProMexico; and Margareta Drzeniek-Hanouz, Head of Global Competitiveness and Risks, World Economic Forum.

General objectives of the meeting

- Present the results of the Latin America Competitiveness Lab's Phase I (2014-2015)
- Assess how the regional recommendations apply to Mexico
- Identify areas where development may benefit from stronger public-private collaboration
- Discuss a possible public-private collaborative project for 2015-2016

Mexico's national context

Latin America Competitiveness Lab Phase I results for Mexico

The results showed that Mexico is pulling ahead of the region in competitiveness. However, gaps occur when comparing the country to the average of OECD countries, indicating room for improvement. The analysis also revealed coordinated policies are needed to respond to most of the country's challenges.

Mexico's innovation gap: additional viewpoints

In addition to the Competitiveness Lab report, an assessment of the country's situation regarding innovation found the following:

- Although investment in research and development (R&D) is low across Latin America (an average of 0.84% of GDP), Mexico's investment rate is lower, at only 0.43%. This indicates the need to encourage more R&D investment, leveraging it through opportunities driven by the country's high-tech exports.
- Private investment in STI is only 0.18% of GDP, versus 1.65% of GDP in OECD countries.
- High-tech content represents 14.7% of all exports, which is very high compared with the average of Latin American and OECD countries (3.23% and 5.92%, respectively).
- Despite having 26% of all tertiary graduates in natural sciences and engineering (much higher than the OECD average), the enrolment level is lower than that of the OECD.
- Investment in work training is only 0.01% of GDP, or 20 times less than the OECD average.
- Adoption of information and communications technology in Mexico shows a gap with OECD countries. Mexico was ranked 30th out of 34 for wireless broadband penetration, and 33rd for fixed broadband.

Assessing the recommendations

Following presentation of the recommendations (which are summarized at the end this report), each participant assessed a set of eight recommendations and selected a first and second choice for implementation, based on the following criteria:

A. The most impactful
B. The easiest to implement
C. The level of progress so far
D. The most likely to be accelerated through public-private collaboration

After the individual assessments were made, each group agreed on no more than three recommendations that, if implemented, could be accelerated the most through increased public-private collaboration. The groups were also asked to answer three questions:

1. What are the selected recommendations' current state of implementation, and what would the benefits of public-private collaboration be?
2. What is already in place that would allow the recommendations' implementation to be accelerated by public-private collaboration?
3. What roles should the public and private sectors play in a collaborative programme to accelerate the recommendations' implementation?

Assessment results

According to the individual assessments, recommendation 6 ("Design public-private research and skills development funding schemes") was the most relevant, as it was selected as first or second choice in three of the five analyses (Figure 12).

Additionally, when observing the result for the recommendation that would most likely be accelerated through a public-private collaborative initiative, recommendation 6 was selected again as the first choice, both in the individual assessments (Figure 12, Criterion E) and the group discussions (Figure 13).

Participants in the kick-off workshop were invited to be part of a task force, consisting of a Steering Committee and a Working Group, to design a plan to implement the recommendation identified as most relevant for Mexico.

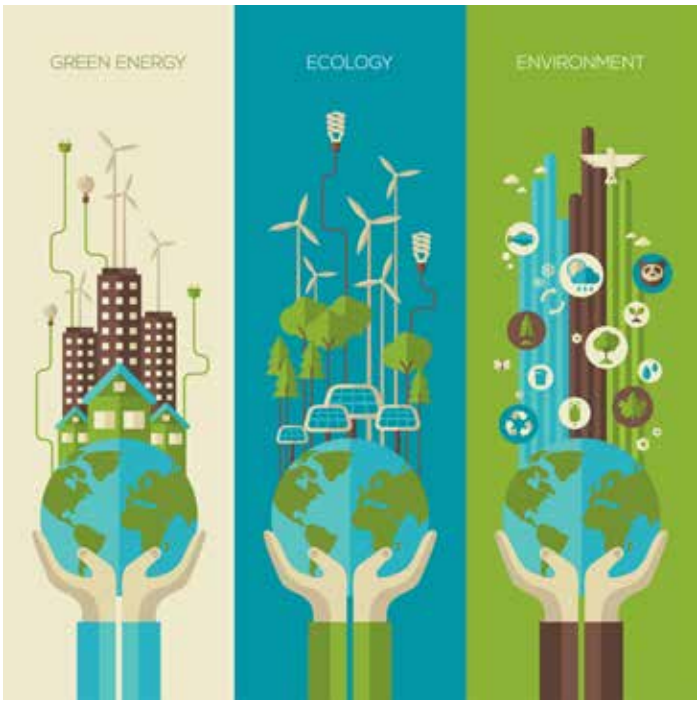
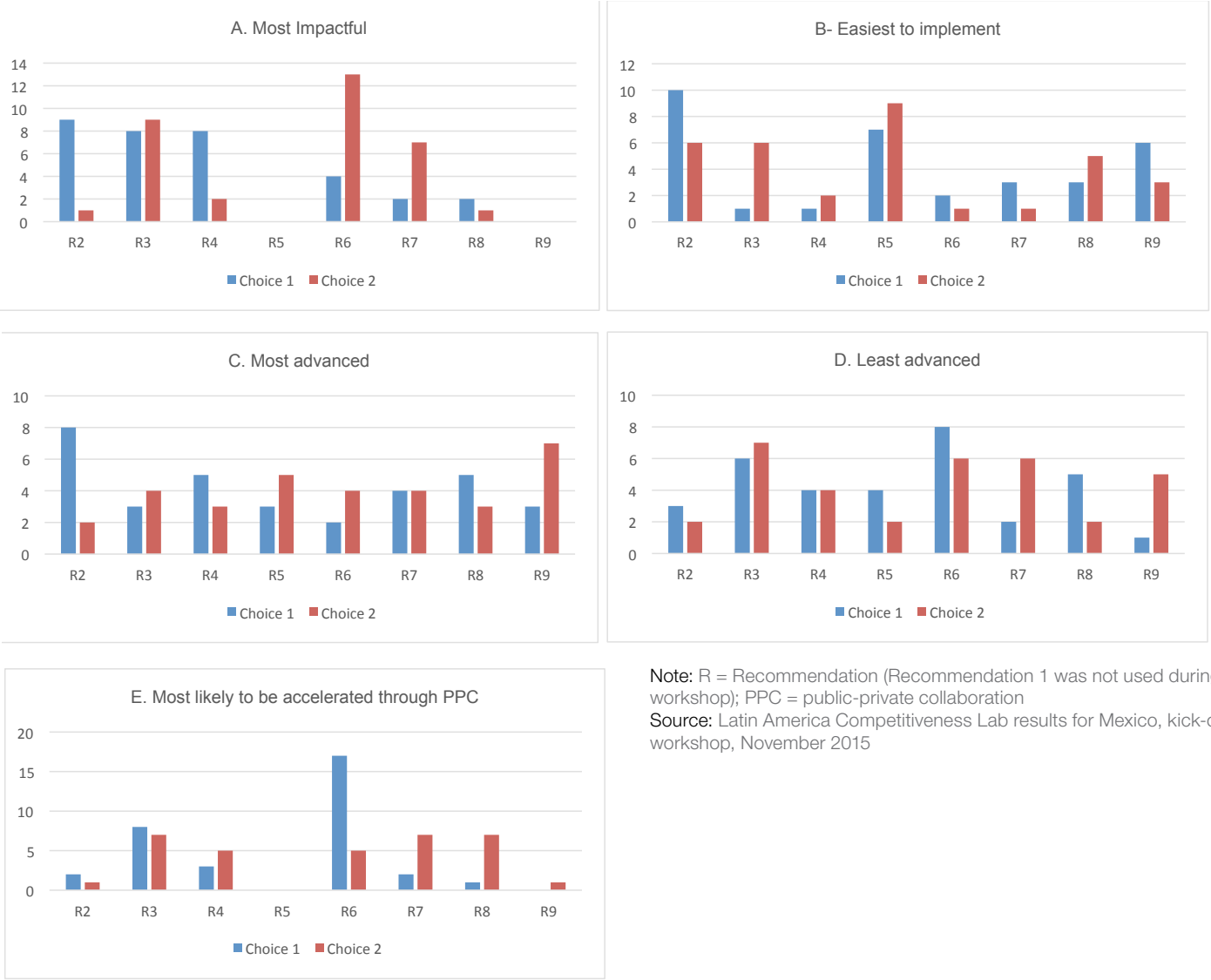
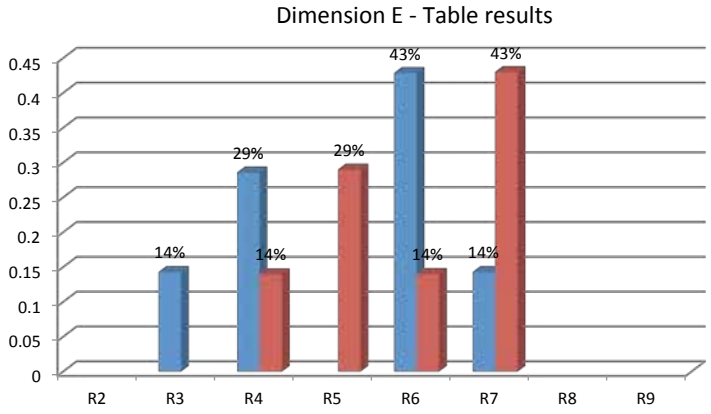


Figure 12: Mexico – Individual Assessment Results
Number of participants selecting the indicated recommendation



Note: R = Recommendation (Recommendation 1 was not used during the workshop); PPC = public-private collaboration
Source: Latin America Competitiveness Lab results for Mexico, kick-off workshop, November 2015

Figure 13: Mexico – Group Discussion Results



Note: R = Recommendation; Recommendation 1 was not used during the workshop.
Source: Latin America Competitiveness Lab results for Mexico, kick-off workshop, November 2015

Appendices

Appendix A – Replicating the Competitiveness Lab
Methodological Description

Introduction

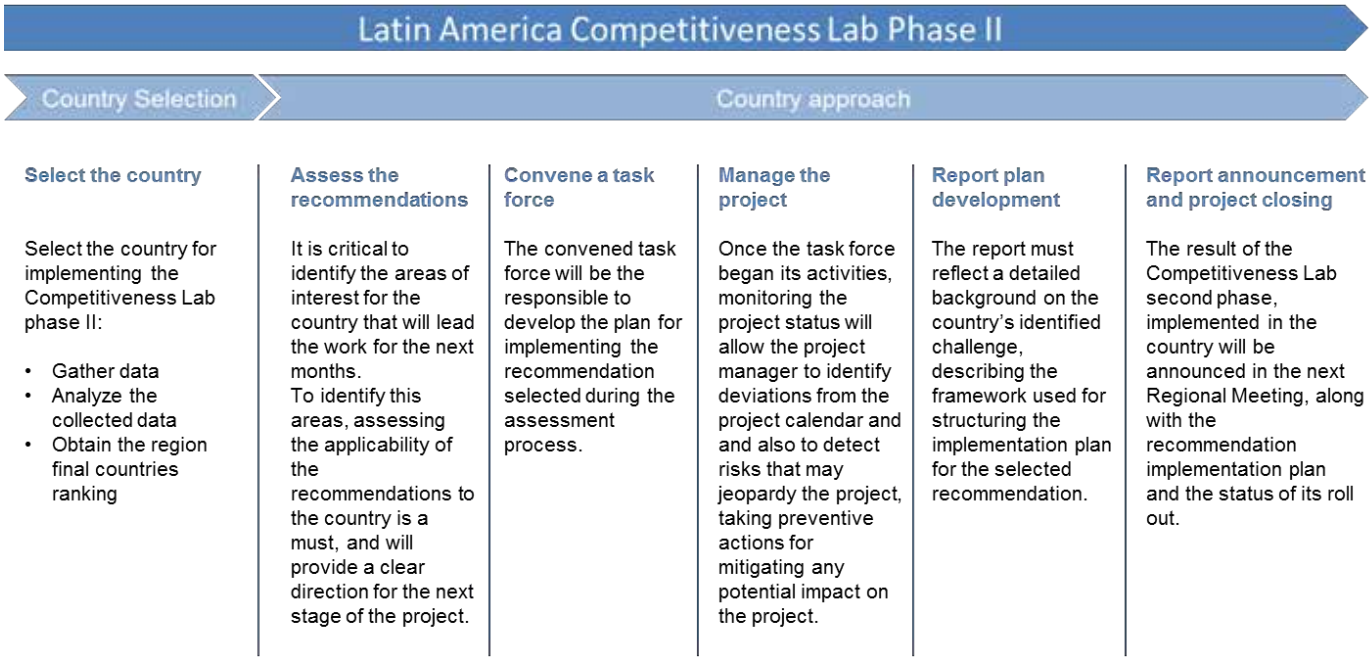
This methodological, step-by-step description serves as a guide to implement the set of recommendations typically proposed by regional Insight Reports. Primarily based on the World Economic Forum's Global Competitiveness Report and the Latin America Competitiveness Lab experience, this section presents a detailed process for countries to implement recommendations that involve a call to action.

To achieve the objectives set out in Phase II of the Latin America Competitiveness Lab, the World Economic Forum Competitiveness Team and Deloitte Project Team developed a methodology that was improved during its implementation and that benefitted from the Colombia pilot and the Mexican experience.

To ensure this methodology's implementation is well coordinated, it is necessary to establish a strong relationship with local government and business leaders to gain their support of the overall process, thereby driving confidence between the various players required for the project's success.

The methodology consists of six steps (Figure A1):

Figure 12: Latin America Competitiveness Lab, Phase II Implementation Methodology



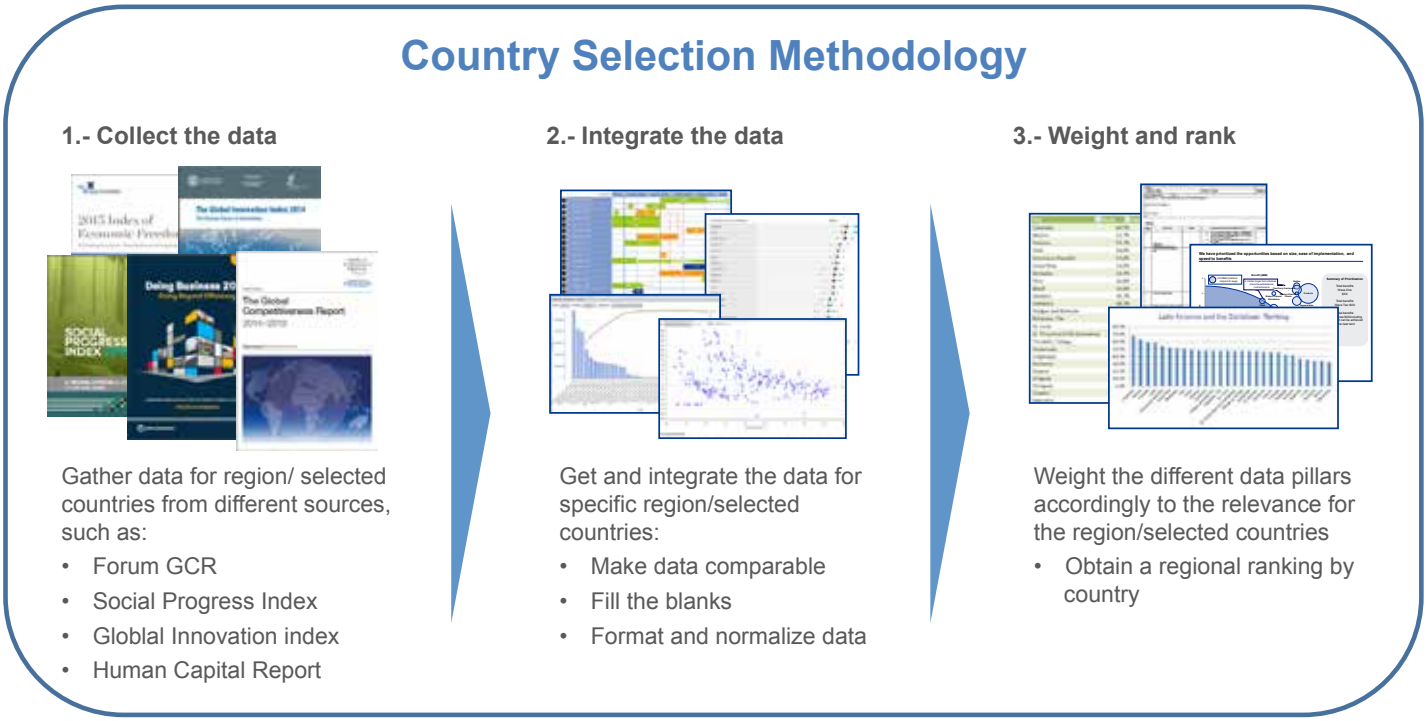
1. Country selection

1.1 Select the country

When implementing recommendations at the country level, the first consideration is to determine which country has the right profile to fulfil the eligibility requirements to launch the project. This is one of the most challenging stages of the country selection process.

A country selection methodology was developed, as shown in Figure A2. It consists of three steps with the objective of gathering and processing data to obtain a ranking of countries in the selected region, thus identifying country readiness to face the challenges of implementing recommendations intended to bridge competitiveness gaps.

Figure A2: Country Selection Methodology



1.1.1 Collect the data

Identifying the proper data sources helps to obtain accurate information. The data collection approach must ensure data are gathered from various sources to get a complete picture of a region or country's status. The process involves transforming the data into information that provides answers to a variety of relevant questions and allows an evaluation of outcomes.

Data collection is a common component in all fields of study and research processes. Although the methods for gathering data may change, the accuracy and relevance of the collection process ensure high-quality data are obtained. This translates into rich information for the decision-making process.

1.1.2 Integrate the data

Once the data have been extracted from the data sources, the integration process can begin. The different types and forms of knowledge must be integrated into one data source.

Compare and organize the data

Data integration is the process of standardizing data definitions and structures by using a common concept or schema across a given collection of data sources. The integrated data must be consistent and logically compatible to initiate deep analysis and obtain rich information that allows ranking the countries of the selected region.

Complete any missing information

Secondary data can be used to estimate those data items for which no information is available. These estimates may cover the aggregate of separate information. By estimating secondary data, a complete data series will be obtained, allowing the final ranking to be made.

1.1.3 Weight and rank the data

To obtain a final ranking, the country data gathered must be weighted to consider their relative importance. Some factors relate to the main topic and have high importance, while others may be closely related but not as relevant. Therefore, different weightings should be assigned to each data source, so that the final ranking represents as accurately as possible the position of each country as determined by the relative value of the assessment factors.

2. Country approach

Many countries face challenges in distinct areas of competitiveness, requiring them to set specific policy and investment priorities. Identifying the areas of interest that will allow the country to define the main workstreams within the project framework is critical. That is why it is important to identify and gain the commitment of local stakeholders from the public and private sectors, civil societies, non-governmental organizations (NGOs) and academia.

To identify the country's areas of interest, the methodology includes a prioritization process to pinpoint the recommendations from the Insight Report that are most relevant to the country. This assessment can be performed through a workshop in which participants are asked to evaluate the recommendations using predefined parameters.

2.1 Assess the recommendations

A kick-off workshop should be held, whose objective is to present the recommendations from the Insight Report to the participants to assess their relevance to the specific country. Organizing the event with local support is crucial for success and will help improve the dynamics of the entire invitation process.

2.1.1 Invitation process

Ensuring the presence of the most relevant business sectors of the economy must be the main goal of the invitation process. It is also important to make sure that a balance between representatives of the public and private sectors, NGOs and academia is achieved. To guarantee a high acceptance rate, invitations should be extended at the highest level. Attaining wide multisectoral representation is a prerequisite for the success of the workshop and the accomplishment of its objectives.

Tips

Leverage the relationship with local partner institutes and seek their support in all aspects of the workshop's coordination and organization.
During the invitation process, keep local public- and private-sector leaders engaged from the very beginning.

2.1.2 Session structure

The session flow must be short, dynamic and focused, due to the high level of the participants.

Define the objectives

The first step in designing the session must be to define clear objectives. These objectives will guide the session's activities. After clear objectives have been defined, the session can be divided into segments, each with a clear time frame, the sum of which will determine the session length. Should the session need to be shortened, this segmentation will facilitate adapting to the new time requirements.

Segment 1: Background of the project

Present the recommendations

To enlighten the participants on the project's background and context, introduce the recommendations, starting with the initial requirements that motivated the Lab, and make specific reference to the main details of the project's development.

The project's framework, the objectives pursued and the results achieved must be described before introducing the new approach for Phase II of the project, which should take a country-oriented approach rather than a regional focus.

Local context

Once the project's background has been presented according to the new country-level approach, illustrate the main innovation indicators and framework derived from the Insight Report (or Phase I report) to the participants.

Examples of these indicators may include:

- Main findings from the project's Phase I, considering the country's relative position regionally
- The level of private investment in R&D, compared to regional standards and data from international organizations, such as the OECD
- The level of private-sector vs public-sector investment in R&D
- The current status of the country's educational system and its main challenges
- Private-sector difficulties to hire employees with the right skills
- Areas showing gaps that require immediate attention

To identify the most valuable indicators for the project, it is necessary to conduct an in-depth review of the country's landscape that considers all the topics related to the main challenges identified in the Phase I Insight Report.

Tips

Don't lose time with data that add no value. Every piece of information should be of significance to the participant. Pay special attention to the topic when designing support material to ensure the participants remain focused in the session.

Segment 2: Discussion on the recommendations

An assessment of the recommendations can begin once the background information has been presented and the participants are focused on the main challenges the country is facing.

Assess the recommendations

To assess the applicability of the recommendations to the country, the participants should individually be asked to characterize each based on its:

A. Impact
B. Ease of implementation
C. Level of progress so far
D. Likelihood of acceleration through public-private collaboration

After the individual assessments have been made, participants can be divided into small groups and asked to agree on two recommendations that increased public-private collaboration would accelerate the most. In addition, each group should answer the following questions:

1. What are the selected recommendations' current state of implementation, and what would the benefits of public-private collaboration be?
2. What is already in place that would allow the recommendations' implementation to be accelerated by public-private collaboration?
3. What roles should the public and private sectors play in a collaborative programme to accelerate the recommendations' implementation?

In some cases, certain programmes that are not widely known are already in place. Mapping all existing programmes and using the Lab format to bridge communication and information gaps on ongoing efforts are important initial tasks that are also valuable at later stages of the Lab.

Also important is the possibility of obtaining preliminary information from key local players on the roles that the public and private sectors should play in a collaborative initiative to implement the selected recommendations.

Tip
Consider using an internet-based survey to quickly obtain the results of the recommendations' assessment. This tool is especially useful to collect the groups' responses regarding the two recommendations they believe would most likely be accelerated through public-private collaboration.

Assess and validate the results
The assessment's results provide the direction for the next stage of the project; the topic selected will set the main workstream. Nevertheless, the groups' understanding of the selected recommendations must be validated. The facilitator should ensure that the participants agree and that the parameters applied during the assessment process were the same for all. Therefore, to validate the process, a representative from each group should be selected to briefly present the reasons behind their decision and state what they believe the recommendations' impact will be.

After each group has presented its arguments, the facilitator should moderate an open discussion, whose outcome should be a full understanding of the meaning of the recommendations and general consensus on its current state in the country.

Tip
The facilitator should not only moderate the session but must ensure the discussion stays on track without drifting from the main topic.

Next steps, expressions of interest and conclusion
At this point in the session, the proposed next steps for the coming months should be explained and milestones and related dates identified. This should help participants decide whether they wish to join the working group for the second phase of the project. Participants should complete a form to indicate how their organization can contribute to the project, in particular with regard to:

- Designing or executing the process to achieve the project's objectives
- Providing human resources or funding
- Supporting the project with company skills, knowledge or capabilities
- Supporting the project's logistics

This crucial step should generate a list of people willing to support the project in various ways. The facilitator should emphasize to those who are not able to participate in the working group that they may nominate others from their organization.

To conclude the session, the facilitator should summarize its main points and recall that the project is a year-long effort. This reminder reiterates the importance of the participants' commitment to the project and to closing the identified competitiveness gap.

Tip
The facilitator should underscore that the members of the working group are entrusted with guiding the initiative and shaping the agenda to improve their country's competitiveness.

2.2 Form the Steering Committee and Working Group

Once the main workstream or topic for Phase II has been identified, the groups responsible for implementing the recommendations selected during the workshop must be formed. Two groups are required: a Steering Committee and a Working Group.

2.2.1 Convene the groups

Purpose
The purpose of the Steering Committee is to provide input and guidance to the Working Group, while ensuring strategic alignment with national programmes and existing initiatives. The purpose of the Working Group is to elaborate the implementation plan, while creating and keeping the communication channels open within the national innovation system.

Benefits
Members of the Steering Committee and Working Group will:

- Help positively shape the design of public policies that address gaps in skills and innovation or other competitiveness gaps in their country
- Participate in a multistakeholder group that aims to create a structured and collaborative agenda between the public and private sectors
- Contribute to their country's competitiveness, helping to bridge the identified gaps

– Have access to the World Economic Forum's leading global practices

Membership

Participation in the Steering Committee and Working Group is by invitation only and coordinated by the World Economic Forum in consultation with Partners and government counterparts. Other leading personalities may be invited based on their expertise and/or relevance to the project.

Members of the Steering Committee and Working Group are entrusted with guiding the initiative and shaping the agenda to improve their country's competitiveness. These groups will include around 20 high-level individuals from:

– The public sector: government and public institutions
– The private sector: Strategic Partners, Regional Partners and Industry Partners
– Civil society: members of the Global Future Councils on Economic Growth and Social Inclusion and academics

Tips

Working in smaller groups has benefits. The recommended size is around 5-6 members for the Steering Committee and 12-15 for the Working Group. Consider the implications of coordinating meetings of larger groups and members' availability.

Responsibilities

A clear definition of each group's responsibilities (Table A1) ensures the project's objectives will be achieved:

Table A1: Steering Committee and Working Group Responsibilities

Group	Membership	Responsibilities
Steering Committee	Top leaders from national governmental agencies related to the project, Forum Partners, leading national representatives and experts from the private sector (based on expertise and/or relevance)	– Provide input and guidance in identifying the top priorities – Ensure strategic alignment with national programmes and initiatives, and existing science, technology and innovation systems – Broker high-level relationships, engagements and dissemination opportunities – Secure implementation commitments from relevant stakeholders
Working Group	Senior representatives from governmental agencies, national representatives and experts from the private sector (based on expertise and/or relevance)	– Design the public-private collaboration – Elaborate the implementation plan – Identify the key players to implement the plan – Create and keep communication channels open within the national competitiveness system

Tips

A recipe for success

To identify potential members, think about the needs of the project, which should be strictly related to the main workstream and of value to the project.

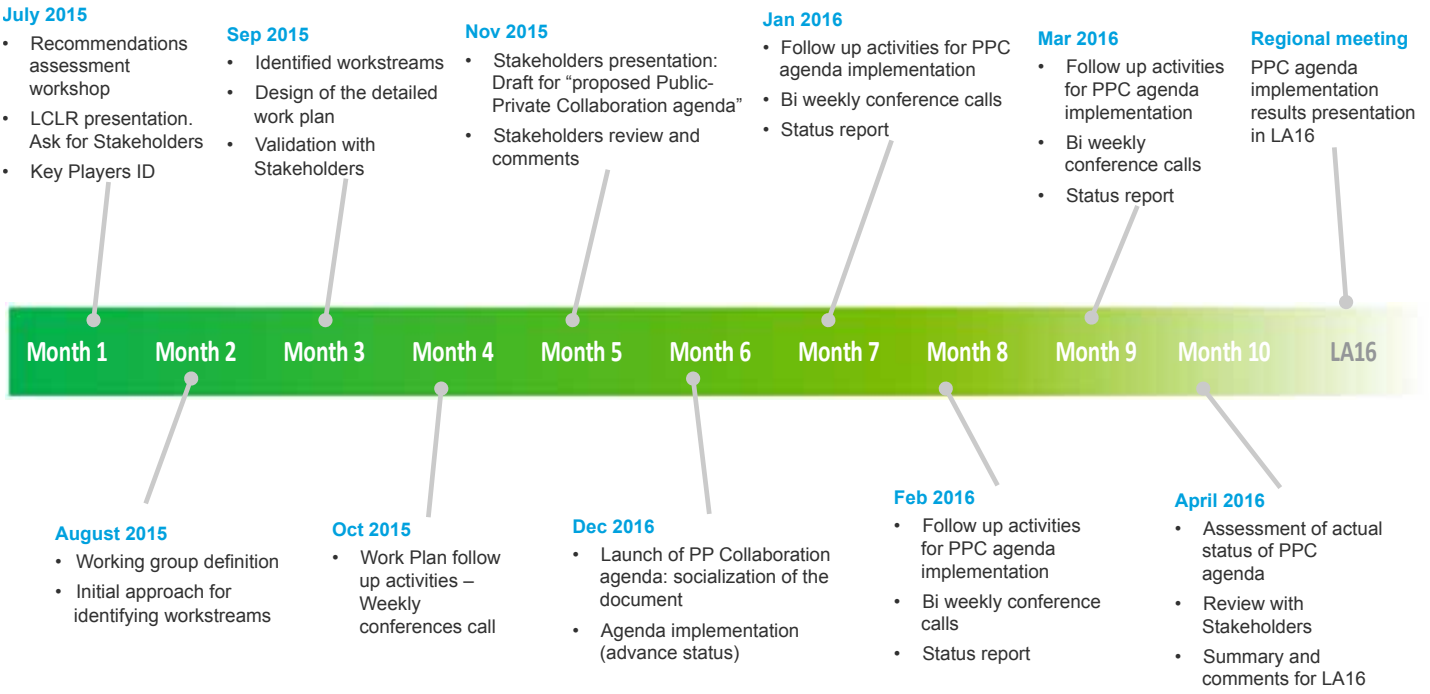
Consider the flexibility of inviting additional members if the ongoing project demands it.

Involve local representatives from development banks and other international organizations.

Project calendar and plan

Creating a project calendar and setting milestones and deadlines provide a clear picture of the project's time frame to achieve the main objectives defined in Phase II. Based on this timeline, the project plan and proposed methodology for implementation should be sketched, as the example in Figure A3 shows.

Figure A3: Competitiveness Lab Project Calendar



2.3 Launch the Steering Committee and Working Group

2.3.1 Steering Committee kick-off session

Depending on the Steering Committee members' availability, this group's kick-off session can be a virtual meeting, during which the host:

- Describes the project's specific background, in view of the Insight Report outcomes
- Presents the purpose of the project's second phase
- Communicates the responsibilities and specific roles of both groups
- Presents the proposed work plan and methodology

2.3.2 Working Group kick-off session

It is highly recommended this session be an in-person meeting due to the various topics that should be discussed and agreed on. To accomplish the kick-off session objectives, the facilitator should:

- Describe the project's specific background, in view of the Insight Report outcomes
- Present the purpose of the project's second phase
- Communicate the responsibilities and specific roles of both groups
- Introduce the Steering Committee members
- Announce the Working Group's objectives and expected outcomes
- Present the proposed work plan and methodology
- Seek agreement on the proposed plan and validate the methodology

The group's agreement on the work methodology is required in order to effectively execute the activities proposed in the work plan.

Tip

Prepare a project activity calendar in advance that indicates clear project deadlines to guide the discussion on the work plan.

2.4 Manage the project

Once the Working Group begins its work, a plan for follow-up activities should be put into place. During the initial stages of the project's second phase, a weekly follow-up call facilitated by the World Economic Forum should be planned to provide assistance and guidance for fulfilling the group's responsibilities. Once the project is in operation, the follow-up activities can be changed based on the project flow and on the requirements needed to achieve the milestones and meet the deadlines.

Monitoring the project's status allows the project manager to identify any deviations from the original calendar and to take preventive action to avoid any divergence from the original plan. If a deviation impacts the project's flow and deadlines, requiring major changes to the project calendar, new decisions must be made in agreement with the Steering Committee.

2.4.1 Stay informed

Unforeseen issues may appear, affecting the course of the project. Keeping stakeholders informed of the project's status helps to reduce the response time in any case. It is crucial to identify potential conflicts at an early stage, to mitigate their potential impact on the project's activities.

Tip

Possessing the skills to build and maintain a strong relationship with the project stakeholders is key for the project's success.

2.4.2 Keep records

Keeping records of any existing workshop, meeting or follow-up call, and sharing them with all project members will ensure that the Working Group and Steering Committee are informed and aligned with the outcomes of these events. Records are helpful in case an unforeseen event occurs, providing background information to make decisions.

2.5 Report on the development plan

A report should be published that includes details on the country's challenges and the framework developed to structure the public-private partnership. Since the expected result is a plan to implement the selected recommendations, the development of a work breakdown structure should be considered, which includes the proposed activity plan and a description of the key players needed to effectively implement the plan.

2.6 Announce the project results and conclusion

Once the plan to implement the recommendations has been completed, the World Economic Forum should present it to the country's authorities, the local government agencies responsible for its implementation. The presentation of the report and announcement of the project results should take place at the next Regional Meeting, where the Forum and the project host country present the case to the public along with the status of the project's rollout.

3. Key lessons learned

A number of factors allowed the implementation of this project and the development of this model. One such factor was the commitment and support of the Colombian government agencies promoting innovation, such as the National Commission on Competitiveness and Innovation, the Ministry of Commerce, Industry and Tourism, the Ministry of Information Technology and Communications, and Colciencias, to name a few.

The high-level Steering Committee was instrumental in engaging relevant players all along the project and when required, and the multistakeholder Working Group enabled a value-added approach in the development of the pilot project.

Although the pilot programme developed in the first country selected was successful, benefitting from the strong support and commitment of public- and private-sector leaders, there is always room in this kind of initiative to improve its performance. The sharing of lessons learned during the process is therefore essential. Recommendations include to:

Manage expectations

Managing expectations is key. The initiative may not provide a solution to all the challenges the country is facing related to innovation and/or skills development, but it will highlight the path to take to confront them and will show that public-private collaboration is possible.

Envision a realistic outcome

To achieve a realistic outcome, taking into consideration the project's time frame and resources, the overall process should be kept simple to ensure the replicability of the pilot project model. Support from government and business leaders encouraging innovation and skills development should be sought and obtained.

Set clear and measurable objectives

Clear objectives must be defined, prompting a good understanding of the expected outcomes and providing an accurate way to measure the project's success. The main subject or topic of the project must be concrete, with the potential to deliver value for the country. Alignment with the country's strategic objectives will also generate value for private-sector players.

Identify project champions

During the course of the project, certain situations may require quick responses. To face them, quick decision-making is crucial, especially when consent is needed. Key people should be identified to form a core group of champions within the Working Group. This group can be called upon at short notice to discuss topics that may require quick responses.

Leverage Working Group expertise

The Working Group must drive the project. Assembling and drafting the recommendations should start early in the process. Working Group members must commit to contributing to the writing process.

Report production

The Lab's end product must be a set of recommendations to present to the Steering Committee for endorsement and implementation. The final Lab report, as can be seen in the companion Mexico Lab Report, must acknowledge the many efforts that contributed to the goal and institutional settings, identify any room for improvement, and suggest possible reforms that can help address any underperformance and provide novel solutions.

Report implementation

Identifying a local champion and existing institutional framework that can lead the implementation of the Working Group's recommendations is critical for project success. Securing buy-in from international organizations capable of providing funding for the implementation and linking the project to larger country initiatives is also worth exploring.

Ensure project governance

Including government, business and academic leaders as well as NGO representatives on the Steering Committee will ensure the commitment and support of the resources needed for the project's success and future implementation.

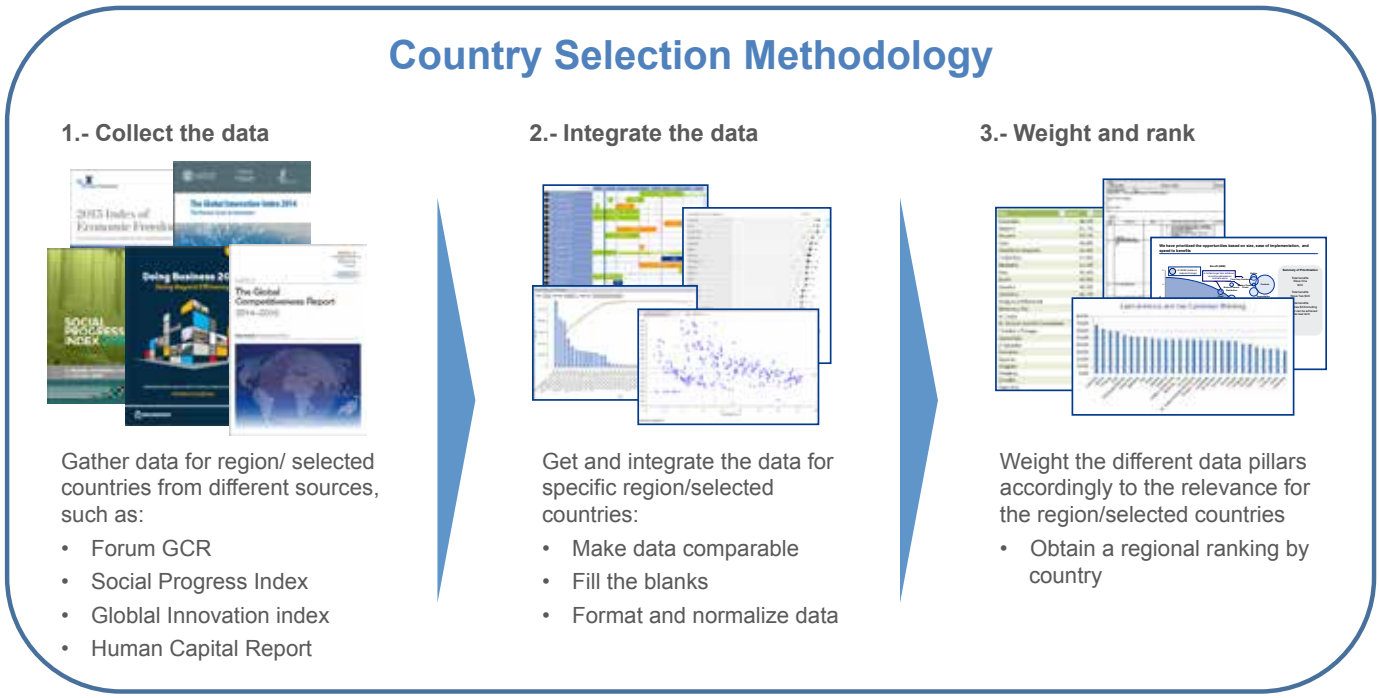
Appendix B – Selecting the Competitiveness Lab Country

Introduction

At the conclusion of the first phase of the Latin America Competitiveness Lab initiative, the World Economic Forum decided to take the recommendations identified to individual countries. The assessment conducted to identify which countries should launch Phase II of the initiative included an analysis of various data sources from independent organizations.

To select the Latin American states eligible for consideration as the pilot country for Phase II, a country selection methodology was developed (Figure B1).

Figure B1: Country Selection Methodology



Country selection methodology

The methodology consisted of three steps with the objective of gathering and processing data to obtain a ranking of the countries of Latin America and the Caribbean, rated according to their readiness to improve their national innovation and skills development capabilities.

The results are presented in this section. They include a description of the data sources and the steps in the methodology.

Latin American and Caribbean country rankings

The region's country rankings are shown in Figure B2. Colombia was the highest-ranked country, attaining a score of 68.50%.

Figure B2: Readiness of Latin American and Caribbean Countries to Improve Innovation and Skills Development

Country/Economy	Score	Ranking
Colombia	68.50%	1.00
Mexico	62.70%	2.00
Panama	59.66%	3.00
Chile	58.75%	4.00
Dominican Republic	54.59%	5.00
Costa Rica	51.80%	6.00
Barbados	51.37%	7.00
Peru	50.60%	8.00
Brazil	49.77%	9.00
Jamaica	48.32%	10.00
Dominica	48.23%	11.00
Antigua and Barbuda	47.97%	12.00
Bahamas, The	47.87%	13.00
St. Lucia	47.87%	14.00
St. Vincent and the Grenadines	47.87%	15.00
Trinidad y Tobago	47.58%	16.00
Guatemala	47.30%	17.00
El Salvador	47.05%	18.00
Suriname	46.05%	19.00
Guyana	45.71%	20.00
Uruguay	45.67%	21.00
Paraguay	41.91%	22.00
Ecuador	41.65%	23.00
Argentina	37.21%	24.00
Cuba	35.60%	25.00
Honduras	34.52%	26.00
Bolivia	34.32%	27.00
Venezuela	32.10%	28.00

1. Collect the data

The data were collected from the following sources:

Doing Business 2015 – World Bank Group[18]
As detailed in *Doing Business 2015*, the report concentrates on regulations that have an effect on small and medium-sized domestic enterprises in the largest business city of an economy (Figure B3). Besides a global ranking on ease of doing business and a filtered (overall) score, the indicators focus on 10 areas:

- Starting a business
- Dealing with construction permits
- Getting electricity
- Registering property
- Getting credit
- Protecting minority investors
- Paying taxes
- Trading across borders
- Enforcing contracts
- Resolving insolvency

Figure B3: Doing Business 2015, Latin American and Caribbean Country Rankings

Economy	Ease of Doing Business Rank	Filtered Rank	Starting a Business	Dealing with Construction Permits	Getting Electricity	Registering Property	Getting Credit	Protecting Minority Investors	Paying Taxes	Trading Across Borders	Enforcing Contracts	Resolving Insolvency
Mexico *	38	1	6	9	14	12	2	6	9	4	4	2
Peru	50	2	14	4	12	1	7	4	2	14	9	10
Colombia	54	3	11	2	13	3	1	1	19	17	31	3
Puerto Rico (U.S.)	57	4	3	22	10	27	3	14	18	15	16	1
Costa Rica	58	5	20	5	3	2	3	27	7	6	22	13
Jamaica	64	6	1	11	17	16	3	6	22	30	18	5
Panama	69	7	2	10	6	9	10	8	28	2	26	22
St. Lucia	77	8	7	6	4	11	25	8	8	9	8	18
Guatemala	81	9	16	18	1	6	7	30	2	12	30	25
El Salvador	86	10	22	26	26	5	7	26	26	1	19	11
Trinidad and Tobago	88	11	8	24	5	25	11	3	14	18	29	9
Dominica	91	12	5	20	8	28	22	8	11	5	11	21
Uruguay	92	13	4	28	9	13	12	19	16	31	17	8
Dominican Republic	93	14	18	3	30	8	15	13	6	3	20	27
Paraguay	100	15	23	7	23	7	13	23	13	24	10	16
Antigua and Barbuda	104	16	17	16	7	15	25	8	25	18	1	19
Bahamas, The	106	17	19	15	27	32	22	17	1	16	7	6
Honduras	110	18	24	14	29	10	3	22	24	25	27	23
St. Vincent and the Grenadines	111	19	10	8	16	26	25	8	10	7	2	29
Brazil *	116	20	28	31	2	20	15	2	30	29	6	7
Ecuador	117	21	27	12	24	4	15	18	20	21	15	24
Barbados	119	22	15	27	20	21	20	27	12	23	28	4
Belize	120	23	26	13	15	18	29	19	4	20	23	12
Argentina	121	24	25	32	19	14	13	4	29	28	3	15
St. Kitts and Nevis	124	25	12	1	18	29	25	14	23	8	5	29
Nicaragua	125	26	21	30	22	24	15	25	27	13	14	17
Grenada	135	27	9	17	11	22	22	19	17	26	13	29
Guyana	137	28	13	23	31	17	30	16	15	27	12	26
Suriname	156	29	30	19	21	30	31	27	5	11	32	20
Bolivia	157	30	29	25	25	23	20	23	32	22	24	14
Haiti	182	31	32	29	28	31	31	32	21	10	21	29
Venezuela, RB	186	32	31	21	32	19	19	31	31	32	25	28

For the full report, click here.

Global Innovation Index 2014 – Cornell University, INSEAD, WIPO

As specified in *The Global Innovation Index 2014* report, the goal of the Global Innovation Index (GII) is to record the many facets of innovation and provide tools that can help tailor policies to encourage long-term output growth, improved productivity and job growth. The Index (Figure B4) promotes the continued evaluation of innovation factors. It provides a database of detailed metrics for 143 economies, which represent 92.9% of the global population and 98.3% of global GDP.[19] The GII is co-published by Cornell University, INSEAD and the World Intellectual Property Organization (WIPO).

Figure B4: Global Innovation Index 2014, Latin American and Caribbean Country Rankings

Country/ Economy	Regional Rank	Score (0-100)	General Rank	Income	Income Rank	Region	Efficiency ratio	Rank
Barbados	1	40.78	41	Hi	37	LCN	0.69	87
Chile	2	40.64	46	Hi	40	LCN	0.68	92
Panama	3	38.30	52	UM	8	LCN	0.85	20
Costa Rica	4	37.30	57	UM	12	LCN	0.81	38
Brasil	5	36.29	61	UM	16	LCN	0.74	71
Mexico	6	36.02	66	UM	18	LCN	0.71	79
Colombia	7	35.50	68	UM	20	LCN	0.63	102
Argentina	8	35.13	70	UM	21	LCN	0.79	43
Uruguay	9	34.76	72	Hi	46	LCN	0.73	75
Peru	10	34.73	73	UM	22	LCN	0.62	107
Guyana	11	32.48	80	LM	8	LCN	0.74	68
Jamaica	12	32.41	82	UM	27	LCN	0.65	100
Dominican Republic	13	32.29	83	UM	28	LCN	0.85	21
Paraguay	14	31.59	89	LM	12	LCN	0.75	63
Trinidad y Tobago	15	31.56	90	Hi	49	LCN	0.63	103
Guatemala	16	30.75	93	LM	13	LCN	0.68	95
El Salvador	17	29.08	103	LM	19	LCN	0.6	116
Bolivia	18	27.76	111	LM	22	LCN	0.7	84
Ecuador	19	27.50	115	UM	34	LCN	0.63	104
Honduras	20	26.73	118	LM	26	LCN	0.53	128
Venezuela	21	25.66	122	UM	36	LCN	0.95	7
Nicaragua	22	25.47	125	LM	28	LCN	0.53	129

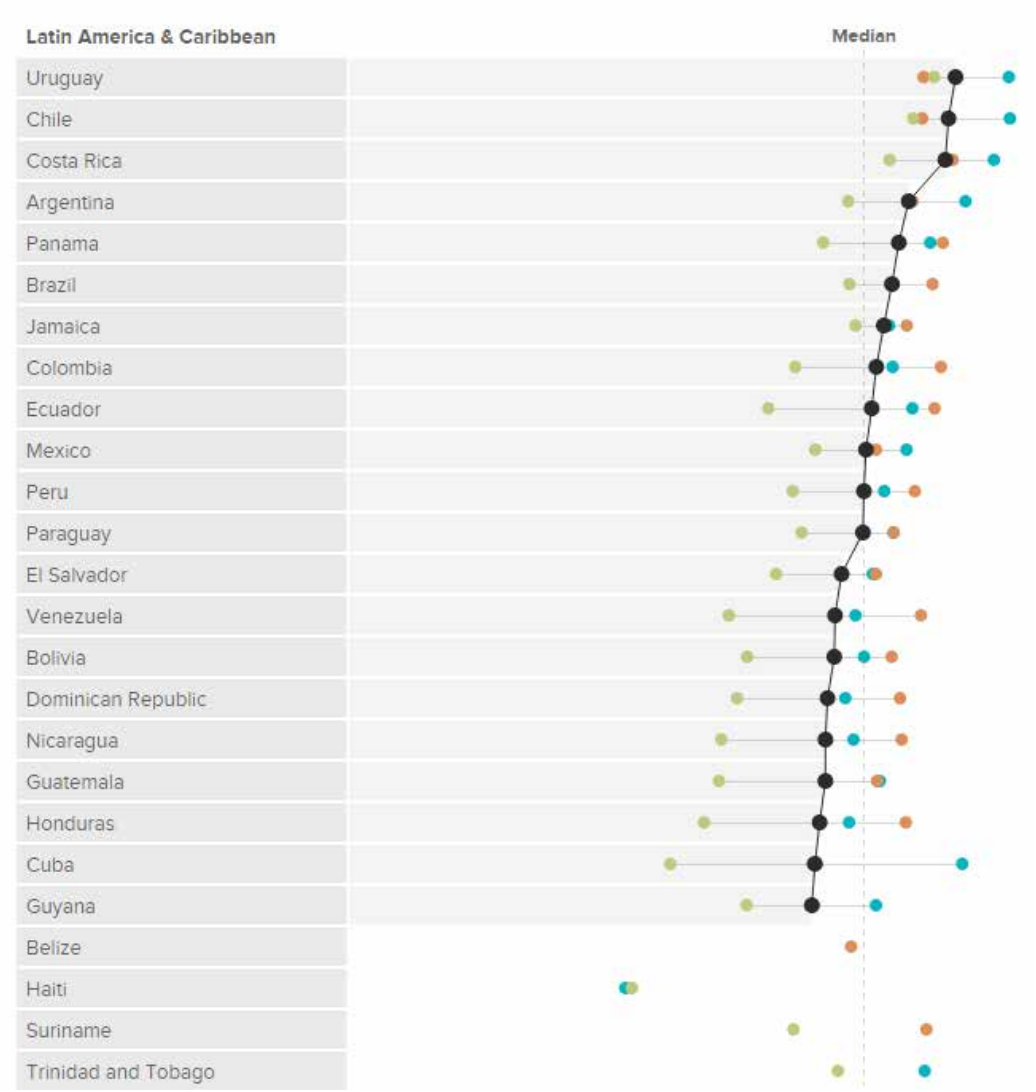
Note: HI = high income; LM = lower-middle income; UM = upper-middle income

For the full report, click here.

Social Progress Index 2015 – Social Progress Imperative

The *Social Progress Index 2015* report presents the rankings of 133 countries, plus partial data for another 28 countries, thus covering 99% of the world's population. The Index exposes marked differences across countries' general social performance and social progress components (Figure B5). The 2015 report presents the main findings from the global perspective (how the world as a whole performs on various components of social progress) and the performance by country:[20]

Figure B5: Social Progress Index 2015, Latin American and Caribbean Country Scores



For the full report, click here.

2015 Index of Economic Freedom – The Heritage Foundation

Poverty, illness and ignorance are receding worldwide, mainly due to greater economic freedom. For the *2015 Index of Economic Freedom* report, the principles of economic freedom that fuelled this progress were once again measured (Figure B6). This annual compendium is published by The Heritage Foundation and the Wall Street Journal.[21]

The Index covers 10 economic freedoms in 186 countries and territories, grouped into four categories of economic freedom:

- Rule of law: property rights, freedom from corruption
- Limited government: fiscal freedom, government spending
- Regulatory efficiency: business freedom, labour freedom, monetary freedom
- Open markets: trade freedom, investment freedom, financial freedom

Figure B6: 2015 Index of Economic Freedom, Latin American and Caribbean Country Scores

Country	Overall score	Property rights	Freedom from corruption	Fiscal freedom	Government spending	Business freedom	Labor freedom	Monetary freedom	Trade freedom	Investment freedom	Financial freedom
Chile	78.5	90	71	76.5	83.3	69.3	67	85.6	82	90	70
Colombia	71.7	50	36	80.3	76	81.5	81.7	80.1	81.2	80	70
Saint Lucia	70.2	70	71	77.7	65.8	75.6	79.8	85.5	72	65	40
The Bahamas	68.7	70	71	97.8	83.2	68.9	75.3	78.8	52.2	30	60
Uruguay	68.6	70	73	77.1	65.1	72.6	64.3	71.6	81.8	80	30
Saint Vincent and the Grenadines	68	70	62	73.3	75.3	70.8	78.2	82.3	68.4	60	40
Barbados	67.9	80	75	73.8	42.1	71.6	69.2	78.2	63.8	65	60
Jamaica	67.7	40	38	81.5	73.2	85.9	76.5	71.4	75	85	50
Peru	67.7	40	38	78.6	88.5	67.7	63.4	83.9	87	70	60
Costa Rica	67.2	50	53	80	89.9	64.5	54.6	75.8	83.8	70	50
Mexico	66.4	50	34	77.8	78	71.5	59.9	77.6	85.6	70	60
Dominica	66.1	60	58	73.6	61.5	71.6	68.7	89.5	72.8	75	30
El Salvador	65.7	35	38	79.4	85.5	53.3	53.3	82.5	85.2	75	70
Panama	64.1	30	35	84.5	78.8	71.5	41.5	76.4	78.4	75	70
Trinidad and Tobago	64.1	50	38	79	69.3	65.3	76.6	74.3	78.6	60	50
Paraguay	61.1	30	24	96	81.9	58.4	26.3	78.3	81.4	75	60
Dominican Republic	61	30	29	84.1	87.1	53.5	57.5	76	77.8	75	40
Guatemala	60.4	20	29	79.6	94.1	54.7	50.6	76.8	84.6	65	50
Nicaragua	57.6	10	28	78.4	76.6	58	56.7	67.8	85.4	65	50
Honduras	57.4	30	26	84.9	78.7	53.2	28	75.4	77.6	60	60
Belize	56.8	30	6.7	82.4	78.3	59.1	61.8	79.3	70.4	50	50
Brazil	56.6	50	42	68.4	50.9	53.6	52.1	69.4	69.6	50	60
Guyana	55.5	25	27	68.7	70.8	63.8	74.5	78.4	72	45	30
Suriname	54.2	35	36	69.3	73.8	42.2	81.9	77.2	66.2	30	30
Haiti	51.3	10	19	80.3	76.2	43.1	63.7	73.5	77.6	40	30
Ecuador	49.2	15	35	79.1	51	51.4	51.3	68.2	71.4	30	40
Bolivia	46.8	10	34	86.8	60.9	53.7	25.5	69.7	77.6	10	40
Argentina	44.1	15	34	66.8	41.2	52.8	43.3	59.6	68.8	30	30
Venezuela	34.3	5	20	75	52	41.6	24.2	42.8	62.8	0	20
Cuba	29.6	10	46	61.8	0	20	20	64.8	63.8	0	10

For the full report, click here.

Global Competitiveness Index 2014-2015 – World Economic Forum

The Global Competitiveness Report 2014-2015 assesses the competitiveness landscape of 144 economies, examining the drivers of their productivity and prosperity. The report assesses national competitiveness worldwide, providing a platform for dialogue among government, business and civil society about the actions required to improve economic prosperity. Competitiveness is defined as the "set of institutions, policies and factors that determine the level of productivity of a country. The level of productivity, in turn, sets the level of prosperity that can be reached by an economy".

The different aspects of competitiveness are captured in 12 pillars, which compose the Global Competitiveness Index (Figure B7).[22] They are institutions; infrastructure; macroeconomic environment; health and primary education; higher education and training; goods market efficiency; labour market efficiency; financial market development; technological readiness; market size; business sophistication; and innovation.

Figure B7: Global Competitiveness Index 2014-2015, Latin American and Caribbean Country Rankings

Country/Economy	Rank	Score
Chile	33	4.6
Panama	48	4.43
Costa Rica	51	4.42
Barbados	55	4.36
Brazil	57	4.34
Mexico	61	4.27
Peru	65	4.24
Colombia	66	4.23
Guatemala	78	4.1
Uruguay	80	4.04
El Salvador	84	4.01
Jamaica	86	3.98
Trinidad and Tobago	89	3.95
Nicaragua	99	3.82
Honduras	100	3.82
Dominican Republic	101	3.82
Argentina	104	3.79
Bolivia	105	3.77
Suriname	110	3.71
Guyana	117	3.65
Paraguay	120	3.59
Venezuela	131	3.32
Haiti	137	3.14

For the full report, click here.

Human Capital Index 2015 – World Economic Forum

The Human Capital Index as reported in *The Human Capital Report 2015* ranks 124 countries on how well they are developing and deploying their human capital, focusing on education, skills and employment (Figure B8). It aims to understand whether countries are wasting or leveraging their human potential. The report measures the "distance to the ideal" by disaggregating data across five age groups to capture the full demographic profile of a country:[23]

- Under 15 years – the youngest members of the population for whom education is assessed among the most critical factors
- 15-24 years – youth for whom factors such as higher education and skills use in the workplace are assessed
- 25-54 years – the bulk of the labour force for whom continued learning and employment opportunities are assessed
- 55-64 years – the most senior members of most workforces for whom attainment and employment opportunities are assessed
- 65 years and over – the oldest members of the population for whom both continued opportunity and health are assessed

Figure B8: Human Capital Index 2015, Latin American and Caribbean Country Rankings

Country/Economy	Rank	Score
Chile	45	71.8
Uruguay	47	71.18
Argentina	48	71.01
Panama	49	71.01
Costa Rica	53	69.75
Mexico	58	68.5
Peru	61	68.13
Colombia	62	67.63
Trinidad and Tobago	67	67.1
El Salvador	70	66.89
Bolivia	73	66.46
Jamaica	74	65.95
Paraguay	75	65.68
Barbados	77	65.09
Brazil	78	64.6
Guyana	79	64.17
Dominican Republic	81	62.79
Guatemala	86	61.34
Nicaragua	90	60.65
Venezuela	91	60.51
Honduras	96	58.93

For the full report, click here.

Potential public-sector engagement

The public-sector engagement seeks to measure the level of commitment expected from government agencies and the existence of an appropriate institutional framework and dialogue conducive to the success of the project.

2. Integrate the data

Once the data were collected from the sources, the integration process began. The different types and forms of knowledge were integrated into one data source.

Compare and organize the data

Data integration is the process of standardizing data definitions and structures by using a common concept or schema across a given collection of data sources. The integrated data were verified to ensure they were consistent and logically compatible.

Complete any missing information

Secondary data were used to estimate those data items for which no information was available. These estimates covered the aggregate of separate information.

3. Weight and rank the data

To obtain the final ranking of the countries of Latin America and the Caribbean in relation to their readiness to improve their national innovation and skills development capabilities, the data gathered from the different sources were weighted according to their relevance to the assessment (Figure B9).

Figure B9: Weight of Sources for Final Ranking of Latin American and Caribbean Countries

Organisation/Institution	Data source	Weight
Cornell University, Insead, WIPO	Global Innovation Index 2014	20%
World bank Group	Ease of Doing Business 2015	5%
World Economic Forum	The Global Competitiveness Report 2014-2015	25%
Social Progress Imperative	Social Progress Index	5%
Heritage Foundation	2015 Index of Economic Freedom	5%
World Economic Forum	Human Capital Report	10%
Governments of countries in Latin America	Public Sector's potential engagement	30%

Endnotes

[1] As identified in the Insight Report for Phase I; see https://www.weforum.org/reports/bridging-skills-and-innovation-gap-boost-productivity-latin-america-competitiveness-lab/.
[2] Colombian Ministry of Mines and Energy, *Science, Technology and Innovation in Energy and Mining: Strategic Plan 2013-2022*.
[3] Schwab, K. (2016).
[4] IEA (2011), citing *Energy Technology Perspectives 2010*.
[5] IEA (2011).
[6] Ibid.
[7] Ibid.
[8] World Economic Forum (2016).
[9] See http://www.si3ea.gov.co/.
[10] Colombian Ministry of Mines and Energy, op. cit.
[11] IEA (2010).
[12] IEA (2011).
[13] IEA (2014).
[14] Ibid.
[15] Inter-American Development Bank.
[16] The World Bank (April 2014).
[17] Development Bank of Latin America.
[18] World Bank, *Doing Business 2015: Going Beyond Efficiency* (2014).
[19] Cornell University, INSEAD and WIPO (2014).
[20] Social Progress Imperative (2015).
[21] The Heritage Foundation (2016).
[22] World Economic Forum (2014).
[23] World Economic Forum (2015).

Acknowledgements

Colombia Working Group

José Acevedo Cobo, Director, Control and Microelectronic Research Group, Antioquia University
Sergio Aldemar Sarmiento Cortes, Manager, Strategic Project and Policy, iNNpulsa
Mónica María Botero Ospina, Adviser, Administrative Department of Science, Technology and Innovation – Colciencias
Alex Fabián Cañas Rengifo, Adviser to the Minister of Mines and Energy, Ministry of Mines and Energy
Lorena Erazo Patiño, Coordinator, Society, Government and TIC Observatory, Externado University
Paola Andrea García, ALEC Investment Manager, ProColombia
Paola García Barreneche, Manager, Investment Promotion, ProColombia
Juan Carlos González Vergara, Vice-President, Investment, ProColombia
Lorena Lizarazo, Associated Researcher, Private Competitiveness Council
Andrés Martínez, Researcher, Ministry of Commerce, Industry and Tourism
Daniel Mendoza Burgos, Adviser to the Deputy Minister of Energy, Ministry of Mines and Energy
Isabella Muñoz, Adviser to the Minister of Mines and Energy, Ministry of Mines and Energy
Claudia Obando, General Secretary and Associated Researcher, Private Competitiveness Council
Yesid Ojeda Papagayo, Adviser, Ministry of Mines and Energy, Science, Technology and Innovation National Programme
Andrés Osorio, Adviser to the Deputy Minister of Labour, Ministry of Labour
María Cristina Piñeros, Partner General Counsel, Deloitte LATCO (Latin American Countries Organization)
Julián Pontón, Director, Technological Development and Innovation, Administrative Department of Science, Technology and Innovation – Colciencias
Juan Felipe Quintero, Director, Rural Development, National Planning Department
Carlos Andrés Rebellón, Director, Technology Government, Latin America, Intel
Juan Fermín Restrepo, Chief Executive Officer, Ladrillera Santa Fe
Diana Carolina Rodriguez, Adviser, ALEC Investment, ProColombia
Angélica Santodomingo, Adviser, High Presidential Counselling for the Private Sector and Competitiveness, Office of the President
Claudia Sepúlveda, Adviser, Productivity and Competitiveness, Ministry of Commerce, Industry and Tourism

Mexico Working Group

Gabriela Alarcón Esteva, Director, Urban Development, Mexican Institute for Competitiveness (IMCO)
Mario Alberto Alvarado, Manager, Innovation, Center for Research and Innovation in Information and Communication Technologies (INFOTEC)
Francisco Javier Anaya, Technical Secretary for Competitiveness, Secretariat of the Economy of Mexico
Gregorio Arévalo, Principal Economist, Competitiveness and Innovation, Inter-American Development Bank
Ana Gabriela Ayala Nuñez, Coordinator, Strategic Planning, Mexican Institute for Industrial Property (IMPI)
Erick J. Calvillo, Lead Industry Partner, Consumer Business, Deloitte
Claudia Carreño, Adviser, Competitiveness, Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food of Mexico
Adrián Carrillo Acuña, Adviser, Competitiveness, National Entrepreneurship Institute of Mexico (INADEM)
Liliana Cedillo Díaz, Director, Innovation Centre, Government of the State of Aguascalientes
Elina Corona López, Deputy Director, Innovation, Secretariat of the Economy of Mexico
Alejandro Farías Zúñiga, Deputy Director, Technological Development, National Council of Science and Technology (CONACYT)
Alicia Félix Mendoza, Director, Analysis, Office of the President
Jonathan Gómez Ceballos, Business Sector Liaison, Intellectual Property Division, Center for Research and Innovation in Information and Communication Technologies (INFOTEC)
Gary Enrique González Rosas, Adviser, Innovation and Competitiveness, National Council of Science and Technology (CONACYT)
Leonardo Iacovone, Senior Economist, Innovation, Technology and Entrepreneurship Global Practice, World Bank
José Antonio Lazcano Ponce, Deputy Director, Technological Development and Innovation, National Council of Science and Technology (CONACYT)
Beatriz Leycegui Gardoqui, Partner, SAI Law & Economics
Salvador Orozco, Director, Innovation, Secretariat of the Economy of Mexico
Mónica Viviana Padilla Molina, Director, State and Regional Development, National Council of Science and Technology (CONACYT)
Hugo Pérez González, Director, Innovation, National Council of Science and Technology (CONACYT)
Rubén Serros Garduño, President, Possible Innovation, Employers Confederation of the Mexican Republic (COPARMEX)

Bibliography

Colombian Mining and Energy Information System (SIMEC), Science, Technology and Innovation Programme for Sustainable Energy Development in Colombia. Available at http://www.si3ea.gov.co/

Colombian Ministry of Mines and Energy, *Science, Technology and Innovation in Energy and Mining: Strategic Plan 2013-2022*. Available in Spanish at http://190.242.114.8:8081/jspui/handle/11146/714

Cornell University, INSEAD and WIPO (2014), *The Global Innovation Index 2014: The Human Factor in Innovation*, second printing. Ithaca, Fontainebleau and Geneva: GII. Available at https://www.globalinnovationindex.org/userfiles/file/reportpdf/GII-2014-v5.pdf

Cornell University, INSEAD and WIPO (2016), *The Global Innovation Index 2016*. Highlights from the report. Available at https://www.globalinnovationindex.org/content/page/GII-Home

Development Bank of Latin America (CAF), "Sistemas Energéticos Sostenibles". Available at http://www.caf.com/media/2554711/caf-energia-2015.pdf

European Commission, Horizon 2020, The EU Framework Programme for Research and Innovation. Available at https://ec.europa.eu/programmes/horizon2020/en/h2020-section/secure-clean-and-efficient-energy

European Energy Efficiency Fund, Advancing Sustainable Energy for Europe. Available at http://www.eeef.eu/

Inter-American Development Bank, Energy: Sustainable, reliable, and diversified energy for Latin America and the Caribbean. Available at http://www.iadb.org/en/sector/energy/overview,18338.html

International Energy Agency (IEA) (2010), *Energy Efficiency Governance Handbook*. Paris: OECD/IEA. Available at http://www.iea.org/publications/freepublications/publication/gov_handbook.pdf

International Energy Agency (IEA) (2011), *Joint Public-Private Approaches for Energy Efficiency Finance*. Paris: OECD/IEA. Available at https://www.iea.org/publications/freepublications/publication/finance.pdf

International Energy Agency (IEA) (2014), *Capturing the Multiple Benefits of Energy Efficiency*, Executive summary. Paris: OECD/IEA. Available at https://www.iea.org/Textbase/npsum/MultipleBenefits2014SUM.pdf

Private Competitiveness Council, Colombia (2015), *National Competitiveness Report 2015-2016*. Bogota: Private Competitiveness Council. Available in Spanish at http://compite.com.co/wp-content/uploads/2016/05/INC-2015-2016.pdf

Schwab, K. (2016), *The Fourth Industrial Revolution*. Geneva: World Economic Forum

Social Progress Imperative, *Social Progress Index 2015*. Washington DC: Social Progress Imperative. Available at http://13i8vn49fibl3go3i12f59gh.wpengine.netdna-cdn.com/wp-content/uploads/2016/05/2015-SOCIAL-PROGRESS-INDEX_FINAL.pdf

The Heritage Foundation (2015), *2015 Index of Economic Freedom: Promoting Economic Opportunity and Prosperity*. Washington DC and New York NY: The Heritage Foundation and Dow Jones & Company, Inc. Available at http://www.heritage.org/index/pdf/2015/book/index_2015.pdf

The Heritage Foundation (2016), 2016 Index of Economic Freedom, "About The Index". Available at http://www.heritage.org/index/about.

The World Bank (2014), *Doing Business 2015: Going Beyond Efficiency*. Washington DC: IBRD/World Bank. Available at http://www.doingbusiness.org/reports/global-reports/doing-business-2015

The World Bank, Energy Sector Management Assistance Program (ESMAP). Available at http://www.esmap.org/node/1299

The World Bank (2014), *Financing Municipal Energy Efficiency Projects*, Energy Sector Management Assistance Program (ESMAP), Knowledge Series 018/14. Washington DC: World Bank/IBRD. Available at https://www.esmap.org/sites/esmap.org/files/DocumentLibrary/FINAL_MGN1-Municipal%20Financing_KS18-14_web.pdf

The World Bank (2014), *Sustainable Energy for All: Sector Results Profile*. Available at http://www.worldbank.org/en/results/2013/04/10/sustainable-energy-for-all-results-profile

World Economic Forum (2014), *The Global Competitiveness Report 2014-2015*. Geneva: World Economic Forum. Available at http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2014-15.pdf

World Economic Forum (2015), *The Human Capital Report 2015*. Geneva: World Economic Forum. Available at http://www3.weforum.org/docs/WEF_Human_Capital_Report_2015.pdf

World Economic Forum (2016), *Global Energy Architecture Performance Index Report 2016*. Geneva: World Economic Forum. Available at http://www3.weforum.org/docs/WEF_Energy_Architecture_Performance_Index_2016.pdf

WORLD ECONOMIC FORUM

COMMITTED TO IMPROVING THE STATE OF THE WORLD

The World Economic Forum, committed to improving the state of the world, is the International Organization for Public-Private Cooperation.

The Forum engages the foremost political, business and other leaders of society to shape global, regional and industry agendas.

World Economic Forum
91–93 route de la Capite
CH-1223 Cologny/Geneva
Switzerland

Tel.: +41 (0) 22 869 1212
Fax: +41 (0) 22 786 2744

contact@weforum.org
www.weforum.org