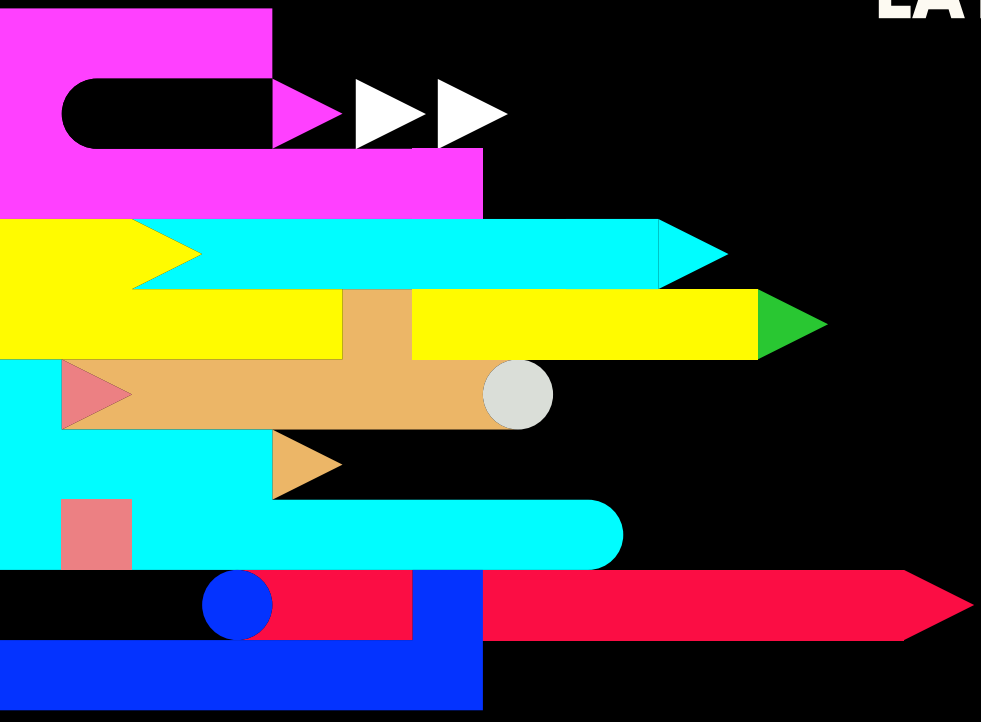
RED SUR
Red Sudamericana de Economía Aplicada

Red Sur Working Paper N°4/2023

PROMOTING A PANDEMIC RECOVERY:
EVIDENCE TO SUPPORT MANAGING THE GROWING DEBT CRISIS PROJECT

INVESTMENT INCENTIVES AND SUSTAINABLE PRODUCTIVE TRANSFORMATION IN LATIN AMERICA



Andrés López
Álvaro Ons

SUPPORT

CSEA Centre for the Study of the Economies of Africa
EPRC 30
Addis Ababa University
fundación ARU
cadep Centro de Análisis y Difusión de la Economía Paraguaya
IDRC · CRDI
Canada

ABOUT RED SUR

The South American Network on Applied Economics (Red Sudamericana de Economía Aplicada, Red Sur), is a policy-oriented research network integrated by public and private universities and centers of knowledge production in the region. It conducts research in the areas of economic development, productivity and innovation, natural resources, inclusive growth, employment, integration, trade and value chains.

Red Sur is interested in promoting regional socio-economic analysis for policy discussion to respond to the challenges of development. The ultimate goal is to generate useful knowledge to address the policy priorities facing the challenge of inclusive and sustainable growth in the region. On this basis, Red Sur promotes, coordinates and develops research projects from an independent perspective and based on rigorous methodologies in coordination with national, regional and international entities.

RED SUR MEMBER INSTITUTIONS

ARGENTINA

Centro de Estudios de Estado y Sociedad (CEDES)

Centro de Investigaciones para la Transformación (CENIT)

Instituto Interdisciplinario de Economía Política (IIEP-UBA-BAIRES)

Instituto Torcuato Di Tella (ITDT) Universidad de San Andrés (UDESA)

BRAZIL

Instituto de Economia, Universidade Estadual de Campinas (IE-UNICAMP) Instituto de Economia, Universidade Federal de Río de Janeiro (IE-UFRJ)

Instituto de Pesquisa Econômica Aplicada (IPEA)

Fundação Centro de Estudos do Comércio Exterior (FUNCEX)

PARAGUAY

Centro de Análisis y Difusión de Economía Paraguaya (CADEP)

Investigación para el Desarrollo (Instituto Desarrollo)

URUGUAY

Centro de Investigaciones Económicas (CINVE)

Departamento de Economía, Facultad

de Ciencias Sociales, Universidad de la República (DECON–FCS, UdelaR)

Instituto de Economía, Facultad de Ciencias Económicas y de Administración (IECON– CCEE, UdelaR

Red Sur WP N°4/2023

INVESTMENT INCENTIVES AND SUSTAINABLE PRODUCTIVE TRANSFORMATION IN LATIN AMERICA

Working Paper of the Project "*Promoting a pandemic recovery: evidence to support managing the growing debt crisis*" (IDRC - Red Sur N° 109742-001)

Luis Piera 1992, Piso 3 - Edificio Mercosur, CP 11.200, Montevideo, Uruguay Website:
www.redsudamericana.org

Is part of the Project "*Promoting a pandemic recovery: evidence to support managing the growing debt crisis*" (IDRC - Red Sur N° 109742-001)

Luis Piera 1992, Piso 3 - Edificio Mercosur, CP 11.200, Montevideo, Uruguay Website:
www.redsudamericana.org

October, 2023
Communication and design: Damián Osta
Production: Diego García

CONTRIBUTIONS AND ACKNOWLEDGMENTS

This work was made possible with support from the International Development Research Centre (IDRC Canada). IDRC promotes and funds research and innovation in and with developing regions to drive global change (see more information on their website: https://idrc-crdi.ca/es).

Red Sur led the project "Promoting a pandemic recovery: evidence to support managing the growing debt crisis", aimed at restructuring public debt for socio-economic recovery and sustainability in Africa and Latin America and mobilized seven research centres from both regions.

The project was led by Fernando Lorenzo (Centro de Investigaciones Económicas, CINVE/Red Sur). The academic direction of the project and the process of elaboration of this document was carried out by Red Sur Regional Technical Coordination team, composed of Andrés López (IIEP-UBA-CONICET/Red Sur), Ramiro Albrieu (Red Sur), Luis Miguel Galindo (Universidad Nacional Autónoma de México, UNAM) and Álvaro Ons (CINVE/Red Sur).

The researchers and centres by country that made up the project's research consortium in Latin America were: the ARU Foundation of Bolivia, under the leadership of researchers Omar Velasco, Wilson Jiménez, Josué Cortez and Diego Peñaranda. The study in Honduras was led by Luis Miguel Galindo (UNAM), Gerson Urtecho and Sergio Sánchez. The study in Paraguay was conducted by Centro de Análisis y Difusión de la Economía Paraguaya (CADEP), under the leadership of Belén Servín, Juan Cresta, Fernando Masi, Fernando Ovando and Dionisio Borda.

The researchers and centres per country that made up the project's research consortium in Africa are listed below. In Nigeria: Centre for the Study of the Economies of Africa (CSEA), under the leadership of Mma Amara Ekeruche, with the participation of Chukwuka Onyekwena; Chris Heitzig; Oreoluwa Adenuga; Oludele Folarin and Kashema Bahago. In Ethiopia, Addis Ababa University - UAA and Institute of Development Policy Research (IDPR), under the leadership of Alemayehu Geda, with the participation of Addis Yimer and Getnet Alemu. In Uganda, the Economic Policy Research Centre (EPRC), under the leadership of Corti Paul Lakuma, with the participation of Sarah N. Ssewanyana; Ibrahim Kasirye; Wilson Asiimwe; Brian Sserunjogi; Rehema Kahunde; Ambrose Ogwang and Smartson Ainomugisha.

For the discussion of the project dimensions of analysis, a series of research workshops were held between December 2021 and October 2022, with the participation and inputs of Red Sur regional team, national teams and with contributions from Cecilia Alemany (UN Women), Arjan de Haan, Paul Okwi, Walter Ubal from IDRC.

The series of publications resulting from the project includes the following titles that are published as Red Sur Working Papers and Policy Briefs, available at www.redsudamericana.org:

Number	Title	Authors/Institution
Policy Brief No 1/2022	G20 Policy Brief Indonesia 2022. Policy Proposals for External Debt Management and Sustainability in Developing and Low-Income Countries TF7 - International Finance and Economic Recovery	Fernando Lorenzo (Centro de Investigaciones Económicas), Luis Miguel Galindo (Universidad Nacional Autónoma de México), Ramiro Albrieu (CIPPEC), Dionisio Borda (Centro de Análisis y Difusión de la Economía Paraguaya), Paul Lakuma (Economic Policy Research Centre), Mma Amara Ekeruche, Alemayehu Geda (Addis Ababa University), and Arjan de Haan (IDRC)
Policy Brief No 2/2023	LAC Policy Brief "Results and Policy Implications in Latin America"	Miguel Galindo (UNAM), Fernando Lorenzo (CINVE/Red Sur) and Ramiro Albrieu (Red Sur)
Policy Brief No 3/2023	Construyendo un futuro sostenible en el Sur Global	Ramiro Albrieu (Red Sur)
Policy Brief No 4/2023	Policy Brief I - Ethiopia: Profile of Ethiopian Debt and its Institutional Challenges: An Exploratory Analysis	Getnet Alemu and Alemayehu Geda (Addis Ababa University/AAU)
Policy Brief No 5/2023	Policy Brief II - Ethiopia: Fundamental and Proximate Drivers of Public Debt in Ethiopia (1980-2023)	Alemayehu Geda and Addis Yimer (Addis Ababa University/AAU)
Policy Brief No 6/2023	Policy Brief III - Ethiopia: A Two-Edged Sword: The Impact of Public Debt on Economic Growth—The Case of Ethiopia	Addis Yimer and Alemayehu Geda (Addis Ababa University/AAU)
Working Paper No 1/2023	Background Document 'Fiscal and Financial Challenges of Climate Transition in Latin America'	Luis Miguel Galindo (UNAM) and Fernando Lorenzo (CINVE/Red Sur)
Working Paper No 2/2023	Climate Change, Fiscal Risks and Public Debt Management in Latin America	Luis Miguel Galindo (UNAM) and Fernando Lorenzo (CINVE/Red Sur)
Working Paper No 3/2023	Consumption Patterns and Environmental Taxation in Latin America	Luis Miguel Galindo (UNAM) and Fernando Lorenzo (CINVE/Red Sur)
Working Paper No 4/2023	Investment Incentives and Sustainable Productive Transformation in Latin America	Andrés López (IIEP-UBA-CONICET/Red Sur) and Alvaro Ons (CINVE/Red Sur)
Working Paper No 5/2023	Estudio País: Construyendo un Futuro Sostenible en Bolivia (in Spanish)	Omar Velasco, Wilson Jiménez, Josué Cortez and Diego Peñaranda (Fundación ARU)
Working Paper No 6/2023	Estudio País: Construyendo un Futuro Sostenible en Honduras (in Spanish)	Gerson Urtecho, Sergio Sánchez and Luis Miguel Galindo (UNAM)
Working Paper No 7/2023	Estudio País: Construyendo un Futuro Sostenible en Paraguay (in Spanish)	Dionisio Borda, Juan Cresta, Fernando Masi, Fernando Ovando, Belén Servin (CADEP/Red Sur)
Working Paper No 8/2023	Effects Of Gender-Inequality During Global Health Emergencies: Evidence from Nigeria	Centre for the Study of the Economies of Africa (CSEA)
Working Paper No 9/2023	Debt for Climate and Development Swaps in Nigeria	Centre for the Study of the Economies of Africa (CSEA)

Number	Title	Authors/Institution
Working Paper No 10/2023	Determining the Optimal Carbon Pricing for Nigeria	Centre for the Study of the Economies of Africa (CSEA)
Working Paper No 11/2023	Sustainable, Inclusive and Environmentally Responsive Debt in Uganda: Implication of COVID 19	Economic Policy Research Centre (EPRC)
Working Paper No 12/2023	Profile of Ethiopian Debt and Its Institutional Challenges: An Exploratory Analysis	Getnet Alemu and Alemayehu Geda (Addis Ababa University/AAU)
Working Paper No 13/2023	Fundamental and Proximate Drivers of Public Debt in Ethiopia	Alemayehu Geda and Addis Yimer (Addis Ababa University/AAU)
Working Paper No 14/2023	A Two-Edged Sword: The Impact of Public Debt on Economic Growth: The Case of Ethiopia	Addis Yimer, African Child Policy Forum (ACPF) and Department of Economics Addis Ababa University (AAU) and Alemayehu Geda, Addis Ababa University (AAU)

CONTENT

EXECUTIVE SUMMARY

In today's global context, Latin America is faced with old and new challenges. For one thing, the elusive goal of significantly reducing the income and wellness gaps with the developed world has yet to be reached. Apart from that, the region must progress rapidly towards the sustainable development goals in a context marked by concerns about the global and local impacts of climate change, the preservation of ecosystems and optimal exploitation – from the intertemporal point of view – of each territory's natural resources. The significance of these factors is reflected in the sharp increase in the frequency and intensity with which weather phenomena occur in most countries in the region (droughts, floods and extreme weather events), with a strong impact on the general level of economic activity and social welfare.

In a bid to accelerate economic growth, the region's governments have often resorted to productive development policies – among other tools – that seek to promote processes of structural transformation in their respective economies. Within these policies, investment incentive systems have usually played a major role, although they have also been aimed at other goals, such as job creation or the reduction of regional inequalities.

There are conceptual justifications for the implementation of productive development policies and the use of investment incentives. However, their application in the region has had differing impacts in terms of their cost-benefit ratio and has sometimes resulted in unintended behaviours (e.g., corruption). The truncated or failed experiences have often fallen victim to macroeconomic and institutional instability, but they can also be put down to the insufficient availability of capacities to adequately design and implement the corresponding policies and anticipate the potential risks inherent in their adoption. Indeed, the existing incentive programmes in the region usually fail to reflect in their design and implementation mechanisms some of the widely accepted best practices, such as making foundations and objectives explicit, implementing monitoring and assessment activities, making programmes and incentives time-bound, and periodically reviewing the inducements offered, among others. The negative consequences of these weaknesses are magnified when complex problems such as productive transformation processes are addressed.

Investment incentive systems in Latin America are marked by having a broad sectoral scope without any specific offset requirements or, rather, with only traditional-type offset requirements (e.g., investment, employment, location in backward areas). They are also heavily dominated by tax incentives, with extensive use of full or partial Corporate Income Tax exemptions. The limited availability of capacities, together with institutional issues that hamper coordination within the public sector and result in other governance problems, is one of the factors that account for the slow progress towards more targeted incentives that seek to encourage certain business activities or behaviours regarded as socially desirable, such as investment in R&D, staff training, linkages with suppliers, upgrading the technological content of production, and investments that will help promote sustainable development.

Indeed, productive development policies and investment incentive programmes can also be used to promote climate transition (green industrial policy). A large number of both developed and developing countries have already implemented numerous initiatives for this purpose, several of which have large budgets, and ambitious decarbonization goals have been established, while stimulating research and development, production, and investment in activities associated with said goals. The countries in the region are taking the first steps in this direction, and the requirements of the present make it necessary to accelerate this process.

The starting conditions in most Latin American countries – characterized by moderately targeted, comparatively generous investment incentives – open up the opportunity for significant redesigned incentives in an investment promotion system designed to contribute to the transition to climate-resilient, carbon-neutral economies. This is feasible even in the context of fiscal restrictions, since the greater targeting of the instruments is consistent with their rationalization, i.e., there is greater effectiveness in terms of development goals together with a reduced impact on public finances. The same goes for the practical consequence of redesign, which is not only that incentives are made available to projects that

contribute to climate transition, but also that they are no longer available to those that do not contribute to that objective.

The reformulation of the incentives should not be limited to the introduction of green requirements or offsets into existing programmes, but it should also include a deep redesign based on the assessment of the relevance, opportunity and conditions for its continuity, reform or termination, and, possibly, the introduction of new instruments. It is also necessary to consider alternative uses of the resources set aside for incentives, both in the context of investment promotion and other significant aspects of the national environmental strategy.

Although the redesign of the investment incentive system will depend on the specific situation in each of the countries, it is feasible to identify a set of possible programme contents that would help define a reformulated system aimed at climate transition: i) Investment incentives, , both general and sectoral in scope, with energy efficiency requirements, reduction of greenhouse gas emissions or adaptation to climate change; ii) Incentive programmes for investment in activities that are the main national sources of emissions for the purpose of incorporating technologies and behaviours that will contribute to reducing such emissions; iii) Incentive programmes for investment in the production of electricity from renewable sources, biofuel production, carbon capture and storage projects, low-emission, high-productivity activities, and activities in clean technology chains, as well as in efficient solid waste management and circular economy and waste recovery mechanisms; iv) Incentive programmes that will support business partnerships as a mechanism for enabling investments in climate change mitigation and adaptation which are beyond the capabilities of individual companies but are feasible through the cooperation of producers in the same line of business and/or region; v) Incentives for R&D spending on technological innovations in products (goods and services) and/or processes that will contribute to climate change mitigation and adaptation.

In this context, institutional aspects are key mainstays of sustainable productive transformation and the climate transition process as a whole. The reformulation of investment incentives involves policy making and implementation capability requirements far greater than those implicit in the current mechanisms. Therefore, increasing those capabilities both in the public and private sector are a component of the sophistication of investment promotion instruments aimed at sustainable productive transformation. This entails greater efforts in building capacities that will help implement these instruments effectively. No significant progress can be expected in situations with suboptimal policies, and with no significant progress in the area of sustainable productive transformation, the countries in the region and their populations are doomed to become stuck in the middle-income trap and will be increasingly exposed to the potentially dramatic effects of climate change.

At any rate, the challenge is enormous, since the complexity and uncertainty inherent in the problems of productive transformation are compounded by those of climate transition. The work of turning traditional practices into incentive policies requires, among other things, high levels of inter-institutional cooperation, which has been hard to achieve in the fragmented governmental structures typical of the countries in the region. As a result, this is not just about correctly identifying the problems to be addressed and the best solutions to mitigate them, but mainly about embarking upon a process of thorough institutional redesign that will contribute to arrangements promoting flexibility and coordination between the various government areas involved in the challenge of sustainable productive transformation.

In summary, the promotion of investments aimed at climate transition and, therefore, structural transformation must be built into a global strategy for sustainable productive development, in which investment incentives are a potentially significant instrument whose successful design and execution requires a profound change in the policy-making processes of the countries in the region. Basically, this is a new way of working based on inter-institutional coordination and collaboration, multidisciplinarity, organizational flexibility, longer horizons and effective public-private dialogue in the context of a more favourable attitude to innovation. This poses a great challenge for governments and political systems, as it requires a very significant upgrade of capacities and a modification of deep-seated traditional behaviours which several previous attempts have failed to alter, and the contemplation of different organizational arrangements that can overcome policymaking inertia in areas or domains and can better address complexity

I. INTRODUCTION

In today's global context, Latin America is faced with old and new challenges. The former include those related to the still elusive goal of reducing the income and wellness gaps with the developed world. As regards the new challenges, the main one is that of adapting to the sustainable development goals in a context marked by concerns about the global and local impacts of climate change and, more generally, the preservation of ecosystems and optimal exploitation – from the intertemporal point of view – of each territory's natural resources. The significance of the environmental aspects is reflected in the sharp increase in the frequency and intensity with which weather phenomena occur in most countries in the region (droughts, floods and extreme weather events), with a strong impact on the general level of economic activity and social welfare (Galindo and Lorenzo, 2023).

One of the several dimensions in which both kinds of challenge intermingle is investment incentive systems. Apart from their varying effectiveness in practice, these systems were devised in a frame of thought that conceived of productive transformation as a key component of any development strategy. Other objectives such as job creation or the reduction of regional inequalities have also traditionally encouraged the adoption of investment incentive mechanisms. A more recent development is the increase in the use of more focused, hard-to-administer incentives which no longer seek to merely attract investment or create jobs per se but also aim to encourage certain behaviours or business activities regarded as socially desirable (e.g., R&D activities, staff training, linkages with suppliers, upgrading the technology content of production, etc.).

Encouraging environmentally-friendly activities or behaviours contributing to climate transition is part of this package of new offsets built into investment incentive systems. In recent years most developed nations, as well as many emerging economies, have actually adopted incentives that seek to align new private investments with the Sustainable Development Goals (SDGs) of the 2030 Agenda, which often include components of the more traditional vision of development (e.g., encouraging activities to generate and disseminate knowledge, promoting local production, emergence of new productive sectors, etc.).

The purpose of this study is to analyze the conceptual foundations on which the decisions to introduce investment incentive systems in general and those associated with the climate transition in particular are based or should be based, considering the empirical evidence on their use, both globally and in Latin America. The aim is to draw lessons that may contribute to a necessary process of redesigning the existing incentive mechanisms in the region in order to reduce their fiscal impact, improve their effectiveness and align them with the sustainable development goals.

The document is organized as follows. The section below examines the conceptual framework around investment incentives and their application to climate transition goals in the context of the "green industrial policy". Section III presents evidence on the use of "green" incentives both globally and in Latin America. Section IV discusses the conceptual and institutional challenges of sustainable productive transformation in Latin America and the role that investment incentives, redefined according to the criteria suggested above, could play in this process. Finally, section V presents a brief summary of the main conclusions drawn from the study.

II. CONCEPTUAL FRAMEWORK: GREEN PRODUCTIVE TRANSFORMATION

II.1. INVESTMENT INCENTIVES AND TARGETING[1]

A usual definition establishes that investment incentives mean quantifiable advantages offered by some level of government – or under its supervision – to specific companies or categories of companies for the purpose of stimulating productive investments subject to the fulfilment of certain requirements or offsets by the beneficiaries.

Investment incentives are therefore part of the set of very diverse variables that may have an impact on investment decisions. The factors determining these decisions, whose specific effects depend on the kind of project and the motivation behind the investment to be made, can be categorized into general economic conditions[2], political-institutional conditions[3] and investment promotion instruments. The first two categories include structural and historical-cultural factors, policies and instruments that contribute to investment but are associated with a broader set of activities and objectives, which does not mean that they cannot play a key role in defining the location of investments.

As regards the third category, investment promotion instruments, it contains specific investment policies that in turn fall into four subcategories (Table 1):

a) The rules and regulations that constitute the general investment regime and whose main purpose is to provide investments and investors with guarantees, rights or protection.

b) Tax and financial incentives, both of a crosscutting nature and those specific to certain sectors or activities.

c) Incentive packages combining instruments – various incentives and support services – in a particular territory and/or sector.

d) Promotional, investor assistance or investment spillover support activities usually undertaken by investment promotion, development, innovation, training and capacity-building agencies.

This study focuses on the second and third of the above categories. Reality shows that investment incentives are widespread in developing countries, regardless of the theoretical arguments for and against their use and the empirical evidence on their effectiveness and the cost-benefit ratio of their impact on the economy as a whole.[4] In a context of political pressures to increase production and employment, incentives are visible measures involving concrete actions that can be implemented comparatively quickly. Incentives can also bring short-term benefits, while their costs may be spread over longer periods and are hard to measure, particularly those that involve forgoing future revenues. It is usually easier for governments to provide these supports than to strengthen the main components of the investment climate.

---

1 The contents of this section are based on García et al. (2021).

2 General economic conditions: size of the domestic market and access to other markets; macroeconomic stability; dynamism of the economy; opportunity to acquire strategic assets; availability of the necessary infrastructure; availability of factors of production under adequate conditions of quantity, quality and cost; economies of agglomeration; local technological and innovation capacities; among others.

3 Political-institutional conditions: institutional quality (governmental stability, integrity of the public sector, efficiency of bureaucratic management, observance of rules and contracts, protection of the various forms of ownership); overall level of tax burden; stability of the tax system; trade openness; migration and repatriation policies; among others.

4 See Garcia et al. (2021) for a discussion of this evidence in relation to FDI.

Table 1. Classification of investment attraction and promotion instruments

	Instruments	*Main content*
General investment regime	Standards and regulations	▪ National legislation on Investment protection ▪ Legal or tax stability investment contracts ▪ Investment promotion and protection agreements ▪ DTA (Double Taxation Agreements) ▪ Public-Private Partnership Regime
Public support for investments	Tax incentives	▪ Full or partial Corporate Income Tax (CIT) exemption (*tax holidays*) or other tax exemptions. ▪ Tax credits on CIT or other taxes ▪ Deductions in the determination of taxable income ▪ Accelerated depreciation
	Financial incentives	▪ Direct grants ▪ Preferential loans ▪ Loan guarantees ▪ Preferential insurance (currency, business risk, political risk)
	Incentive packages	▪ Special economic zones, free trade zones and similar arrangements ▪ Industrial and science and technology parks ▪ Target development regions ▪ Sectoral promotion schemes
	Promotional activities, investor assistance and other support	▪ Country image promotion ▪ Investor assistance (pre-investment and execution) ▪ Post-investment support (Aftercare) ▪ Policy advocacy ▪ Spillover promotion: supplier development, human resource training and capacity-building, promotion of innovation and technology transfer

Source: Devised by the authors based on García et al. (2021).

The current situation and the prospects for the application of investment incentives in Latin America, which are discussed below, make it necessary to pay particular attention to tax incentives, i.e., those deviations from the general tax regime that reduce the tax burden on companies in order to encourage them to invest in particular projects or sectors (UNCTAD, 2000). In this regard, Appendix 1 contains a description of the main kinds of tax incentives, including the advantages and disadvantages usually attributed to them and some crucial aspects of their design and implementation.

Financial incentives are also part of investment promotion strategies in several countries, but they are rarer in developing countries (particularly those with small economies) since the usual fiscal restrictions make it easier to forgo taxes than to provide fresh money. Several developed countries turn to grants, which may or may not require the provision of offset funds by the private investor, require varying degrees of discretion for their approval and target different objectives and kinds of projects, depending on the case. Loans or guarantees under preferential conditions – often granted by public development banks – are among the main financial incentives in some developing countries, especially midsized and large ones.

Investment incentives can be characterized according to how demanding the different kinds of requirements and offsets to their beneficiaries are and their different scopes in terms of productive activities or sectors. This targeting seeks a greater and more direct impact of the instruments on the goals of the productive development strategy, and this is achieved by orientating the incentives in two main non-exclusive directions:

a) Promoting investment in specific sectors or products characterized, for instance, by high technological content, comparatively greater human-resource intensity, the quality of employment, expected dynamism, the potential to transform other sectors, the contribution to climate transition or internationalization.

b) Promoting particular behaviours, such as R&D, innovation or other strategic activities, specialized training of human resources, circular economy or the use of clean technologies.

The consideration and graduation of both dimensions helps to build an analytical framework for a system of investment incentives that will simultaneously address the differentiation between sector-specific and crosscutting incentives and the level of sophistication of the compensations required from their beneficiaries associated with the alignment of the design of the instruments with the development goals (Table 2).

The sectoral targeting dimension starts with a general scope or absence of discrimination, goes through a stage of broad sectoral scope – such as policies for the manufacturing industry – and ends up in its application to a specific sector or product. As regards the dimension of targeting development goals, it starts with a situation in which incentives do not require any significant offsets, goes through the requirement of "traditional" offsets, and finally reaches its highest degree of targeting when more "sophisticated" objectives, which may be additional to the previous ones, are pursued. Traditional offsets are considered to be those involving requirements such as investment, exports, job creation or location in a target development region. In turn, greater sophistication implies addressing – explicitly and in a non-accessory fashion – other offsets, such as spending on R&D&I, the technological content of the activity, specialized capacity-building for human resources, linkages with local suppliers and other spillovers in the domestic economy, and contribution to climate transition.

Table 2 outlines some of the instruments implemented by Latin American countries. The bottom left-hand corner shows general-application instruments with no significant quid-pro-quo requirements, as the requirement basically involves the performance of some economic activity, without any specific requirements involving investments or job creation, among others. This would also be the case of a reduced general rate of the Corporate Income Tax (CIT), which is usually included in the set of tax incentives, although it does not strictly fit the definition as it does not imply a deviation from the general taxation regime.

The higher up you move in the first column of the Table, the narrower the sectoral scope of the instrument becomes, with an absence of any significant requirements or offsets, while the further you move to the right in the bottom row, the more sophisticated the offsets become in the context of instruments of a horizontal nature. The bottom right-hand quadrant, for instance, shows an R&D investment tax credit with a (crosscutting) business process focus, while the top right-hand quadrant shows the greatest focus on both dimensions. Undertaking a technology-intensive or knowledge-intensive activity, or a strategic activity in the sense that it has the potential to transform other sectors, or an activity that contributes to climate transition is in itself regarded as a sophisticated offset. Green incentives, which are introduced

below, are located along the right column and are part of the set of sophisticated investment incentives or incentives with sophisticated offsets, which, in turn, has a correlation in terms of capacity requirements for their design and implementation by the public sector and their use by companies.

Table 2. Classification of investment incentives by dimension and intensity of targeting

Specific	*Textile and Clothing Maquila (Guatemala)* *Automotive Industry (Uruguay)*	*Natural Gas Industrialization (Bolivia)* *Tourist Industry (Nicaragua)*	*Renewable Energies (Dominican Republic)* *Biotechnology (Argentina)* *ICT (Brazil)*
Broad		*Development of Extreme Areas (Chile)* *Industrial Parks (Uruguay)*	*Promotion of Knowledge Economy (Argentina)*
General	*Industrial, commercial and service free trade zones (Paraguay)* *Reduced general Income Tax*	*Accelerated depreciation (Honduras)* *Mega Investments (Colombia)* *Reduced CIT on new investments (Ecuador)*	*R&D Tax Credit (Mexico)* *Increased deduction of eco-efficient expenses (Ecuador)*
	No significant offsets	**Traditional offsets**	**Sophisticated offsets**

TARGETING BY DEVELOPMENT GOAL

Source: Devised by the authors based on García et al. (2021).

An incentive does not qualify as sophisticated or as involving sophisticated offsets if the requirement related to development goals is merely complementary in that the investment project in question has access to significant – albeit minor – benefits without satisfying the sophisticated offset. This is the case, for instance, when the incorporation of clean technologies is associated with additional benefits but is not a requirement for accessing benefits.

II.2. INDUSTRIAL POLICY AND PRODUCTIVE TRANSFORMATION

From a broad perspective, industrial policies are assimilated into productive development policies (PDP) with their three essential characteristics:

a) They involve deliberate interventions by the public sector aimed at increasing an economy's productivity and converge with the levels of developed economies (Cornick, 2016; Devlin and Moguillanski, 2011).

b) They involve policies and instruments aimed at promoting the growth and improvement of certain key activities – such as R&D&I, the training of digital talent or exports –, large sectors of the economy – such as manufacturing or agriculture –, or even specific sectors, value chains, clusters and products (Melo and Rodriguez-Clare, 2006; Fernandez-Arias et al., 2010).

c) They seek to alter the production structure to favour sectors and subsectors with higher productivity levels and better expansion prospects in a way the market forces never would in the absence of interventions (Pack and Saggi, 2006; Hausmann et al., 2008).

This is a broad definition with three pillars: the key goal of improving productivity, horizontal and vertical targeting of policies and instruments, and productive transformation. Productive transformation refers to a modification in the production structure resulting from the development of sectors or products – new or higher-quality goods and services – with great potential for growth and the incorporation of value added. Studies for large samples of countries on the evolution of per capita income and the pattern of sectoral diversification of the economy (Imbs and Wacziarg, 2003) and per capita income and the number of exported products (Klinger and Lederman, 2004) suggest that a dynamic process of productive transformation is a necessary condition for converging with the levels of development of high-income countries. In turn, this kind of transformation process is unlikely to occur without any deliberate public policies that will promote it (Crespi et al., 2014). Indeed, evidence shows that proactive public policies have been instrumental in convergence success stories (Salazar-Xirinachs et al., 2014).

In keeping with these arguments, PDPs have been featuring more and more prominently on the policy agendas of developing countries since the early 2000s, which has been attributed to a number of factors: (a) the need for more strategic approaches to obtain benefits in a scenario of globalization; (b) success stories in East Asia associated with the implementation of policies supporting learning and skill accumulation; (c) poor results in terms of diversification and sophistication of productive activities under more liberal policy regimes; (d) the debate on the risk of a middle-income trap; (e) the international financial crisis that reopened the discussion on market regulation and active policies; and (f) mounting widespread concern for sustainable development (ILO, 2014; OECD, 2013).

The theoretical justification for PDPs or industrial policies is basically a result of the presence of static and dynamic market failures, which hints at the existence of externalities that introduce a gap between the net social benefit of productive activities and the net private benefit perceived by the market agents controlling such activities (Crespi et al., 2014). This need for industrial policies is reinforced in the context of productive transformation processes in developing countries for at least two reasons. One is that market failures that require these interventions are a prevailing phenomenon in those countries (Hausmann et al., 2008). The other reason is that such market failures are far more common in new or knowledge- and innovation-intensive sectors, including sectors that are strategic on account of their ability to drive the innovative development of other productive activities such as information and communications technologies, biotechnology and knowledge-intensive services, among others.

This study does not aim to address in detail the relevance of industrial policies or the investment incentives that are part of them. We feel that, following up on the above, over the last two decades, there has been growing consensus on the need for well-formulated, well-implemented PDPs or industrial policies differing greatly from the import substitution policies applied in the region last century. The theoretical case for industrial policies is well established, and opposition to it is based mainly on implementation-related difficulties (Rodrik, 2008), mostly linked to so-called governance failures.

Incentives are part of the PDP toolkit, and, theoretically, this kind of instrument would therefore contribute to materializing investments that have failed to come to fruition due to the presence of market failures or the interest in stimulating investments leading to positive spillovers on the rest of the economy. In this regard, incentives would be provided not only against investment commitments but also in exchange for companies developing or locating in the country certain kinds of activities or functions that would likely have significant impacts on the productive structure and the social fabric.

In practice, however, there are a number of other reasons for applying incentives, including promoting the development of backward areas, compensating for the negative effects of other public policies (e.g., exemptions intended to remedy the implementation of protectionist tariffs), attracting ""anchor"" investments, and the existence of incentives in other jurisdictions competing to attract certain types of investments.

Additionally, a number of governance failures have been identified that could lead to the adoption of incentives that are incompatible with the intended objectives, have negative cost-benefit ratios, may lend themselves to corrupt practices or are captured by private interests. Such failures include: (a) governments that do not have sufficient information to identify activities, sectors, products or markets with some precision or estimate the spillovers of investments and, consequently, the extent of the incentives to be provided; (b) developing countries that do not have competent government departments to meet the requirements implicit in the design, administration and control of incentive policies, especially if these include sophisticated offsets; c) incentives are particularly prone to capture[5] and corruption because they lend themselves to rent-seeking actions by companies; and d) the possibility of providing incentives to companies that would have invested anyway (redundance). Along the same lines, it has been noted that investment incentives compete for public resources that could be applied to improving the components of the investment climate, such as human capital and infrastructure, and that "bidding wars" may break out between competing countries, leading to the costs of incentives exceeding the social benefits of investment (UNCTAD, 2003). [6]

The above objections are relevant in that they reflect real dangers in the use of investment incentives, but they do not warrant their exclusion from the public policy toolkit. At any rate, they constitute strong warnings that should be considered for the proper design and implementation of policies, since they are frequent cause of their failure.

II.3. GREEN INCENTIVES AND CLIMATE TRANSITION

Green incentives do not circumvent the problems posed by the design and implementation of promotional instruments. On the contrary, they exacerbate them. As a matter of fact, activities aimed at climate change mitigation and adaptation give rise to several positive externalities, although they are badly affected by lapses in coordination, information asymmetries and dynamic economies of scale, among other market failures. The introduction of green technological innovations often encounters obstacles associated with two kinds of externalities. Firstly, externalities may emerge as a result of the agent introducing the technological innovation failing to capture all the gains associated with the transformations in production processes. Secondly, market prices do not recognize the advantages of this new technology in aspects that are still undervalued, a typical phenomenon when adapting production processes to respond to the negative effects of climate change.

The three key pillars of the PDPs – namely, increasing productivity, targeting policies on certain sectors, activities and development goals, and productive transformation – are also guiding criteria for the design and implementation of policies and instruments to promote activities aimed at climate change mitigation and adaptation. Both are directly related to the transformations that should be effected in the ways of

[5] Capture refers to situations in which certain interest groups take control of or have a decisive influence on public policy decisions in order and direct them towards their own interests.

[6] Thomas (2011) argues that as a result of these "wars", companies have started considering the process of deciding how to use the investment as a revenue-generating activity in itself.

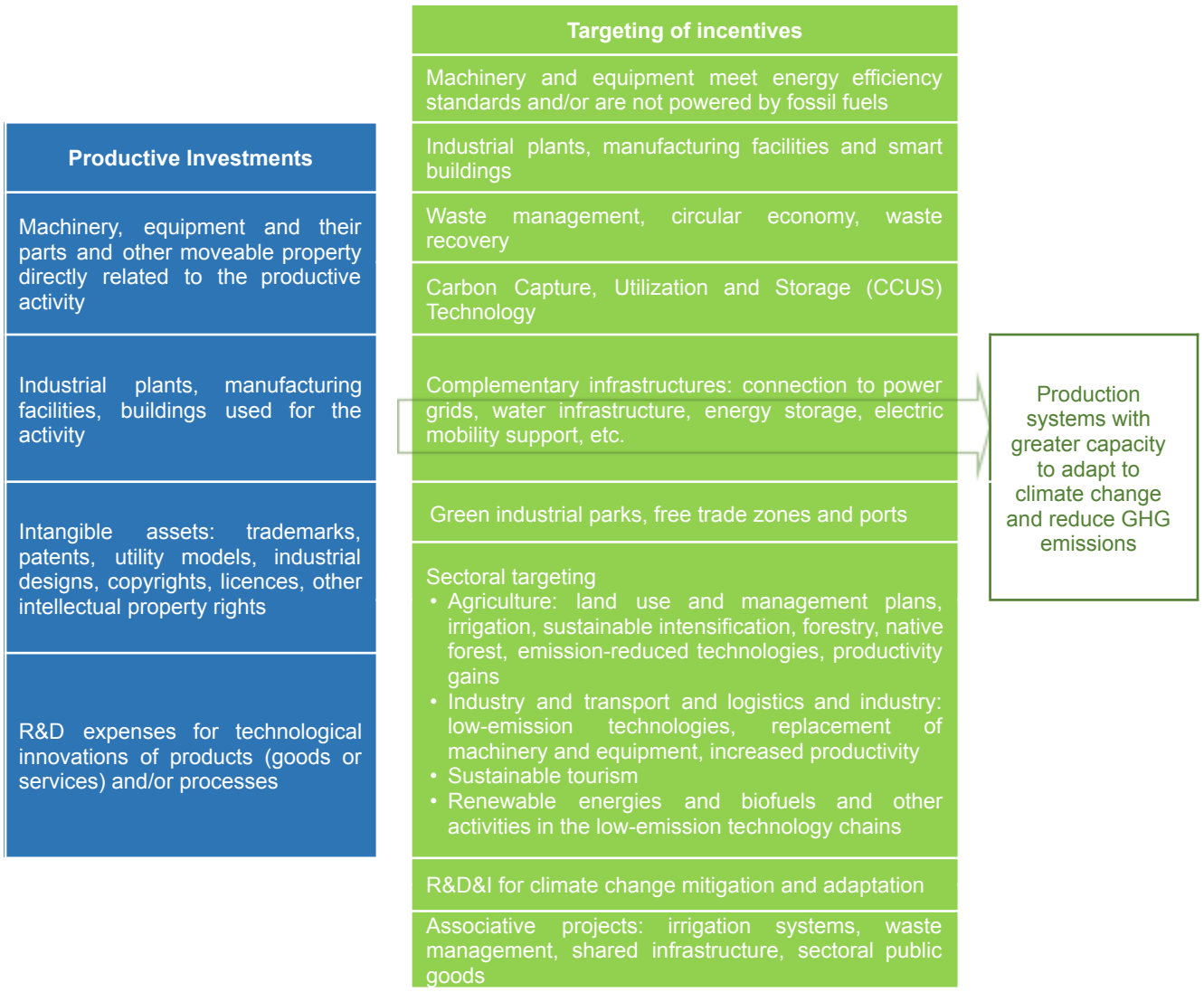
producing certain goods and services. Indeed, a more efficient use of natural resources and the expansion of sectors and activities that are key to climate change call for adjustments in investment behaviour. At the same time, the necessary contraction of production in activities responsible for the highest levels of greenhouse gas emissions, which should occur during the transition to carbon neutrality, constitutes a challenge for investment incentive systems. Therefore, industrial policies and the investment incentives that are part of them have a major role to play in the transformation to a climate-resilient, carbon-neutral economy.

In keeping with the above, green incentives – understood as incentives for investment in activities associated with sustainable development – are part of the package of what has recently been dubbed "the green industrial policy". Altenburg and Rodrik (2017) define green industrial policy as any government measure aimed at accelerating the structural transformation to a low-carbon economy that is efficient in the use of productive resources, which, in turn, makes improvements in the economy's productivity possible. The discussion of green incentives is related to both the broader debate on investment incentives and the specific justifications for aiming such incentives at deep decarbonization and the efficient use of natural resources.

According to Page (2017), green industrial policy seeks to address three main kinds of market failures. Firstly, investment in the development and production of green goods can have significant positive social impacts, both environmentally (e.g., improved air quality, biodiversity protection, sustainable resource management, climate change mitigation) and economically (e.g., the creation of technological capabilities, knowledge spillovers, higher labour force qualification, the development of "strategic sectors"). As is often the case in the analysis of externalities, producers do not take full ownership of the benefits of these actions. Secondly, in the absence of early support, potentially beneficial activities or projects in terms of climate transition may not come to fruition for a variety of reasons, including the reluctance of private sector investors and/or lenders to fund the early stages of a new industry (innovative and/or with an uncertain evolution), the need to reach a certain scale for competitiveness, or lapses in coordination, with the emergence of one industry being prevented by the absence of another industry. Thirdly, there may be latent comparative advantages from a less polluted environment, pre-existing economic and cultural practices or a creative workforce which, coupled with a sufficient flow of funds and a stable, significant demand, could result in long-term productivity improvements. In short, as mentioned above, these are essentially the same arguments that warrant the adoption of investment incentives in general.

In this paper, we shall focus on the granting of financial or tax incentives aimed at promoting investments and productive projects related to environmental sustainability objectives. The potential of investment incentives to contribute to the climate transition process depends on their ability to effectively guide productive investments in accordance with the requirements of this process (Diagram 1).

Diagram 1. Investment Promotion for Climate Transition



Source: Devised by the authors.

Productive investments, according to a broad definition, include moveable and immoveable property that is part of the fixed assets, the intangible assets associated with intellectual property and R&D expenses

for technological innovations in products and/or processes. In this regard, the specific features and sectoral makeup of the productive investments to be directed by means of incentives will determine production technologies, infrastructure, technological innovation capabilities and the evolution of the sectoral structure of production. In this context, green incentives involve requirements and offsets guided by crosscutting to climate change mitigation and adaptation objectives, the treatment of sectors and activities that are the main national sources of emissions, and the promotion of those associated with the structural transformation to a climate-resilient, carbon-neutral economy.

Diagram 1 provides several examples of incentive targeting in both dimensions. As stated above, compliance with environmentally-based requirements and offsets should be a condition for access to any level of benefits rather than simply an option for obtaining additional, relatively marginal benefits. In general, green incentives imply a level of sophistication of public policies that calls for greater design and implementation capacities than those implicit in the usual mechanisms in many developing countries, characterized by little to no targeting: accurate identification of actions and activities; definition, monitoring and control of offsets; assessment of outcomes and impacts; and the systematic review and subsequent adjustment of the instruments. Furthermore, this must be done in the context of the necessary coordination and integration of environmental and productive development policies in public sectors where, in most emerging economies, management is usually fragmented and compartmentalized.

Indeed, green industrial policy can be understood as an intersection of productive and environmental policy areas, with the resulting implications of addressing public policy issues that cut across jurisdictions and policy domains.[7] The necessary coordination between PDPs and environmental policies should be implemented using the policy integration modality, which means that policy making in certain domains takes into account objectives of other domains. This consideration may go in both directions, and the concept of integration does not necessarily imply a bias towards or prioritization of one area or another, so the relative weight of productive and environmental objectives will depend on each national context and the prevailing preferences. However, the effects of climate change and the requirements of climate transition, including the international commitments made by countries in these matters, are increasingly determining the need for Environmental Policy Integration (EPI), a coordination approach originally promoted in the European Union system, which involves:

a) Incorporating environmental objectives at all stages of policy making in non-environmental sectors, with specific recognition of this goal as a guiding principle for policy planning and implementation;

b) the intention to aggregate the expected environmental consequences in an overall assessment of the policy;

c) the commitment to minimizing contradictions between environmental and sectoral policies by giving, in principle, priority to environmental policies (Lafferty and Hovden, 2003).

The definition of EPI gives environmental objectives some priority over sectoral objectives, and that is the basic difference between the concept of EPI and the general concept of policy integration. EPI prioritizes the environmental dimension of sustainable development and aims to improve environmental policy outcomes by prioritizing environmental considerations and incorporating them into sectoral policies[8]. Aside from the particular modality, policy integration is a long-term process that requires profound changes in the institutional context, including administrative practices and prevailing beliefs in

[7] A policy area or domain is made up of a relatively stable set of actors, involves somewhat common problems and approaches to them, and has established institutional linkages that govern decision-making (May, Jochim and Pump, 2010).

[8] It has been argued that this is a narrow interpretation and that integration should be interpreted as “policy integration”, meaning a process of coordinating several policies horizontally and vertically as the best way to support the transition to sustainable development (Briassoulis, 2004).

government and inter-jurisdictional relations. The ability to integrate policies is critical in determining a government's ability to comprehensively address a crosscutting policy problem.[9] In general, there is no established culture of inter-institutional cooperation in the public sectors of the Latin American region, and no suitable incentives have been implemented to promote such a culture. On the contrary, as mentioned above, the public sectors are highly compartmentalized, with several ministerial units and agencies coexisting with overlapping mandates, which results in various difficulties in coordinating policies and instruments. We shall return to this problem in subsection IV.1.

III. INCENTIVE POLICIES IN PRACTICE

III.1. PUBLIC SUPPORT FOR INVESTMENT IN LATIN AMERICA

Most Latin American countries offer relatively generous investment incentives as part of instrument systems which only moderately target development goals. Programmes with a broad sectoral scope and no specific offset requirements or, rather, with traditional offset requirements – i.e., investment amounts, job creation and/or location in a target development area – are common.

The overwhelming majority of these incentives are tax incentives with extensive use of tax holidays – full or partial Corporate Income Tax exemptions. Most of the potentially significant tax incentives are combined in incentive packages focusing on the development of a sector, area of the country or activities under free trade zone or similar regimes. Many are the countries where free trade zones are the main instrument for investment promotion and attraction (Colombia, Costa Rica, the Dominican Republic, El Salvador, Honduras, Nicaragua and Uruguay). In other cases, the main instruments in terms of tax use and tax expenditure are associated with regional development objectives: a) the preferential customs and tax regimes for the so-called extreme areas in Chile[10]; b) the Special Development Areas and the investment promotion regime in the Amazon in Peru; c) the Special Customs Area of Tierra del Fuego in Argentina; and d) the Manaus Free Trade Zone and various regional development regimes in Brazil (Northeast and Western Amazon, among others). In turn, some countries are implementing various sectoral regimes (Argentina, Colombia, the Dominican Republic, Honduras, Panama and Uruguay), the most common sectors being renewable energies, tourism, software and IT services, and global services (call centres, shared service centres and business process outsourcing companies).

The usual tax incentives, apart from tax holidays, are exemptions from or abated rates in: a) import tariffs and other import duties; b) VAT on imports and local purchases; c) specific consumption taxes; d) property and real estate transfer taxes; and e) subnational taxes, fees and contributions. These incentives usually apply to transactions involving raw materials, intermediate goods and machinery, equipment and its parts, as well as land, buildings and facilities used for the production of goods and services. Additionally, tax credits for R&D&I expenses and investments are among the main tax incentives that are not related to sectoral and/or regional targeting and are not restricted to free trade zones (Argentina, Brazil, Chile, Colombia, Mexico, Panama and Uruguay).

In Latin American countries there are relatively few cases of significant financial incentives, and they are concentrated in the larger countries. The case of Brazil stands out for its export credits, guarantees and credit insurance offered by the *Banco Nacional do Desenvolvimento* (*BNDES*), the regional Development Banks, the regional Development Funds, the regional Constitutional Financing Funds and the regional Investment Funds. The scope of these programmes also includes foreign companies based and managed in Brazil, and Brazilian companies with capital control abroad. Mexico offers export credits,

[9] Policy integration should be regarded as a process of institutional and political change rather than an intended policy outcome (Candel and Biesbroek, 2016).

[10] The free trade zones of Iquique and Punta Arenas are also significant in terms of their use and are based on regional development motivations.

guarantees and credit insurance through the *Banco Nacional de Comercio Exterior* (BANCOMEXT) which reach foreign investors in Mexico and Mexican companies with foreign capital. In Argentina, the *Banco Argentino de Desarrollo* (BICE) offers loans on preferential terms but with lower ceilings than those in Brazil and Mexico, although they target large companies.

In federal countries, particularly Brazil and Mexico, very significant incentive packages for large investment projects have been implemented at the state government level, with substantial financial incentive components that include direct grants through specific infrastructure and access to industrial land under advantageous conditions. In both countries, the largest grants have been awarded to global car assembly companies. In the case of Argentina, in general, there is no evidence of provincial investment incentives on a scale comparable to the above incentives.

In the other countries in the region, financial incentives consist largely of preferential credit programmes and, occasionally, public credit guarantee systems for working capital and the purchase of fixed assets, which in most cases apply exclusively to micro, small and medium-sized enterprises (MSMEs).

Furthermore, in countries with larger economies and/or higher levels of per capita income in the Latin American region, a variety of grant or non-refundable support programmes are usually available for the limited funding of specific investment projects. They involve the incorporation of fixed assets, technological upgrade (e.g., digitalization) and capacity building. Incentive programmes also tend to support innovation and internationalization projects for certain products or processes. In several cases, these programmes focus on MSMEs, either because larger companies are excluded as beneficiaries of these instruments or because the maximum grant amounts make them suitable or significant only to smaller companies. Funding through this channel usually accounts for a majority percentage of the total cost of the project, and, in most cases, the smaller the company, the smaller the benefit provided. This kind of scheme is usually implemented by public agencies specializing in business development, internationalization, investment promotion, innovation or training and capacity building.

III.2. GREEN INCENTIVES IN THE REGION

The most significant green incentives implemented in the Latin American region are sectoral incentive packages for investment in electricity generation from renewable sources and, to a significantly lesser extent, packages promoting reforestation and biofuel production.[11] Table 3 shows the incentives – most of them tax-related – that have been provided as part of promotional packages for renewable energies in Latin America. It also shows specific incentives, especially import tax exemptions and increased allowances for the purchase of equipment related to renewable energies (solar panels, wind turbines and their parts, among others) and energy efficiency. More rarely, and for a relatively limited number of beneficiaries given the total amounts allocated to the programmes in the region, the countries in the region provide non-refundable support for projects or activities aligned with climate change mitigation and adaptation, such as the acquisition of energy-efficient equipment, the implementation of circular economy models and environmental management systems, and the implementation of R&D projects in related areas, among others.

The relatively limited use of green incentives does not imply that "green investment projects" – i.e., those that can contribute to climate change mitigation and adaptation – do not benefit from significant incentives. On the contrary, these projects probably have access to the most generous benefits available from the respective national incentive systems. For instance, in Paraguay, a country without any significant green incentives, a free trade zone regime was approved in 2020 for the establishment of a green biofuel plant with an investment of several hundred million dollars. Likewise, Costa Rica's free trade

[11] Colombia, Nicaragua and Panama have regimes in place that provide tax incentives for investments in the forestry-timber chain with incentives for the afforestation and conservation of natural forests. Argentina, Honduras and the Dominican Republic have implemented tax incentives for biofuel production which are not currently in operation.

zone regime includes renewable energies in sectors regarded as strategic and, therefore, as eligible for the highest levels of benefits. Green investments can benefit from sector-wide investment incentive programmes with no environmental offsets in place in several Latin American countries. This aspect of the current reality will shape a possible transition to a green incentive system for investments in the region, since a redesign would mean an end to granting incentives that do not contribute to climate transition rather than granting incentives to projects that contribute to that objective. The policy implications of this kind of strategy are discussed in subsection IV.

Table 3. Incentive packages for investment in renewable energy generation in Latin America.

Incentives	ARG	COL	ES	GUA	HON	NIC	PAN	RD	URU[1]
Corporate Income Tax (CIT) Incentives									
Full CIT exemption for a specific period				■	■	■			
Partial CIT exemption for a specific period			■						■
Tax credit for a percentage of the investment based on GHG emission reductions							■		
Tax credit for a percentage of the investment in works later used by the general public							■		
Tax credit for a percentage of the investment in energy self-consumption								■	
Accelerated depreciation of generation equipment	■	■					■		
Special allowance of a percentage of the investments in R&D&I in this area		■							
CIT exemption on the distribution of dividends or profits reinvested in infrastructure projects in the country.	■								
Reduced withholding tax on interest payments on external funding								■	
Withholding tax exemptions on payments of services or fees to foreigners					■				
Extension of the period for offsetting losses	■								
Tax incentives for imports or local purchases									
Tax exemption on the import of equipment, machinery, materials, etc.	■	■	■	■	■	■	■	■	■
VAT and other tax exemptions on the sale of equipment, machinery, etc.		■			■			■	■
VAT refund advance	■								
Other tax incentives									
Exemption from all taxes on income from Emission Reduction Certificates			■						
Tax credit for a percentage of the local content of the investment	■								
Exemptions from other taxes				■	■				■
Other Benefits									
Guaranteed sale of energy through long-term supply contracts					■			■	■
Privileged market access for the purchase of energy from renewable sources						■	■		
Partial reimbursement of costs incurred for connection to the network								■	

[1] *The Uruguayan renewable energy regime grants only partial CIT exemption but expressly allows investors to apply to the general investment promotion regime for tax benefits other than CIT exemption (tax exemptions on imports and local acquisitions and from Wealth Tax exemptions).*

Source: Devised by the authors.

III.3. INTERNATIONAL EXPERIENCE

The survey on the use of green incentives on an international scale is based mainly on information from the public policy database managed by the International Energy Agency (IEA).[12] This survey of 50 initiatives is complemented by the incorporation of two boxes that outline two mega-initiatives – one promoted by the United States (Inflation Reduction Act), and the other by the European Union (European Green Pact) – which incorporate both accelerating the green transition and boosting local production and technological development as objectives.

***The Inflation Reduction Act* (EEUU)**

On August 16, 2022, in the midst of the highest inflation in 40 years, the United States enacted a federal law called "The Inflation Reduction Act" (IRA). The IRA is a set of measures aimed at lowering inflation through three pillars: reducing the fiscal deficit, lowering drug prices and promoting investment in clean energies.

At the environmental level, the programme seeks to reduce greenhouse gas (GHG) emissions – different estimates suggest that such a reduction would be between 32% and 42% by 2030 compared to 2005 – by means of an investment of around USD 370 billion (including tax credits and exemptions, grants and loan guarantees), or an estimated 1.5% of GDP in 2022[13].

The law is broad and covers a number of activities aimed at promoting investments in zero-emission technologies, such as solar, wind and geothermal technologies, as well as in disruptive technologies, such as carbon capture and storage, clean hydrogen production, and in more traditional technologies such as nuclear energy and biofuels. It also includes incentives for greater energy efficiency in the productive sector, households and the public sector, and for promoting the production and sale of electric vehicles. The benefits also cover heavy manufacturing (steel, cement, glass, aluminium, chemicals, paper), with support at an estimated USD 6 billion for the reduction of emissions in the industrial process. Furthermore, extra incentives are provided for projects located in underprivileged and low-income communities. [14].

The bulk of the Inflation Reduction Act budget goes to providing tax credits, especially to businesses and, to a lesser extent, consumers. As a matter of fact, tax incentives aimed at promoting private investment in clean energy and the transport and manufacturing sectors account for over half of the USD 216 billion budget.

The two most significant schemes are the Production Tax Credit (PTC) and Investment Tax Credit (ITC). While some technologies qualify for only one specific scheme of the two, others may opt for either. The tax credit granted by the ITC starts at 6% and may increase to 30% depending on whether the project meets local content requirements (iron, steel, manufacturing components), is located in disadvantaged areas, or undertakes to maintain the wage levels of the workers involved in the construction or maintenance of the project for 5 years. Meanwhile, the PTC provides incentives of 0.5 to 2.6 cents per kilowatt per hour (kWh), depending on the type of technology and local content, location and wage commitment criteria.[15]

[12] https://www.iea.org/policies

[13] https://www.mckinsey.com/industries/public-and-social-sector/our-insights/the-inflation-reduction-act-heres-whats-in-it [retrieved on March 27th, 2023]

[14] https://www.wri.org/update/brief-summary-climate-and-energy-provisions-inflation-reduction-act-2022 [retrieved on March 27th, 2023]

[15] https://www.epa.gov/green-power-markets/inflation-reduction-act#:~:text=Inflation%20Reduction%20Act%20and%20

Regarding the incentives for transition to electromobility, the key component is a tax credit of as much as USD 7,500 for buyers of electric vehicles assembled in the USA. However, two requirements must be met (meeting each of them generates a USD 3,750 credit) for access to the full tax benefit: a) 40% of the raw materials must be extracted, processed or recycled in the USA or a country that has a Free Trade Agreement with the USA; and 2) 50% of the battery components must be manufactured in the USA, Canada or Mexico (as part of the T-MEC). Both percentages are also expected to increase over time.

As we can see, the actions intended to encourage investment in projects associated with the green transition are linked to the purposes of stimulating domestic production and "reindustrializing" the United States. They are also part of the strategies for promoting reshoring (production in the US), nearshoring (T-MEC member countries) and "friendshoring" (countries with which the US has Free Trade Agreements) in the context of geopolitical tensions with China and concerns over the robustness of global value chains

As regards the IEA database, the analysis focuses on measures that promote investments associated with improvements in energy efficiency and waste management, the deployment of renewable energies, and CCUS (carbon capture, utilization and storage) activities. It also considers initiatives related to the productive sector, thus excluding the residential, transport and government sectors. It only contemplates direct support mechanisms, such as grants, tax exemptions, tax credits, accelerated depreciation and loans, guarantees or the availability of other types of funding, such as venture capital. Therefore, preferential tariff schemes, or tenders through which governments guarantee the purchase of certain volumes of different types of renewable energies, are not covered.

The information from IEA was complemented with internet searches and consultations with experts, which led to the inclusion of measures that are not available on the IEA database, including, in particular, those aimed at improving waste management and recycling activities (circular economy). Finally, it should be noted that the initiatives surveyed are at varying degrees of implementation, and, in general, no information on their impact is available. Indeed, some of them may already have been discontinued because they were planned as temporary measures and, at any rate, most of the measures have been adopted recently, and several are even in the announcement or early implementation phase. However, this does not undermine the objective of providing an insight into the different kinds of instruments being implemented in different parts of the world.

Appendix 2 is a roundup of evidence gathered on 50 initiatives promoting investment in activities associated with the green transition in different developed and developing countries and regions of the world. It presents information on the country where the measure was adopted, the title of the measure, the nature of the incentive provided, the type of green transition it supports, its objectives and specific characteristics. The types of green transition considered include renewable energies, energy efficiency, emission reduction, equipment replacement, the development of new technologies, carbon capture and storage, waste management and recycling. It should be pointed out that this is not an exhaustive list but an illustration of some initiatives that have been implemented in various countries to promote a green transition through different types of investment incentives. Additionally, it should not be interpreted as a list of "best practices" since, as mentioned above, many of them have only been recently been adopted or are in their early implementation stages, and, in the case of the oldest ones, it has not been possible to investigate the possible existence of impact studies. Despite these limitations, the survey is illustrative of the concerns in most countries regarding the issue of environmental sustainability, the type of mechanisms implemented to address these concerns and the amounts allocated to fund these mechanisms (which can often be extremely significant).

Green%20Power%20Partners,-The%20Inflation%20Reduction&text=It%20offers%20new%20access%20to,communities%20with%20environmental%20justice%20concerns [retrieved on March 27th, 2023].

The European Green Deal

On December 11th, 2019, the European Union presented the "European Green Deal", a strategic plan devised to address climate change and environmental degradation through the generation of a competitive, green, digital and circular industry, research and development for the acceleration of transition, the conversion of transport and the generation of cleaner, more efficient energies. The aim is to reduce greenhouse gas (GHG) emissions by 55% by 2030 from 1990 levels and achieve zero emissions by 2050.[16]

To implement the framework plan, the resource requirement estimated by the European Commission is at least EUR 100 billion in sustainable investments over the next decade, half of which would be financed directly from EU funds, another EUR 45 billion by mobilizing private investments through loans, guarantees and other types of support under "InvestEU", and to a lesser extent from national budgets. The European Commission will also assist Member States in planning fiscal reforms focused on energy transition, such as the elimination of fossil-fuel subsidies, as well as guidelines for a new taxonomy for the creation of a common classification system for sustainable economic activities.[17]

Another of the programme's pillars is the Innovation Fund, which is complemented by "InvestEU" and is worth an estimated EUR 38 billion, aimed at subsidizing innovative projects in renewable energy technologies, carbon capture and storage, and innovative low-carbon processes in energy-intensive industries. Its first call in 2020 resulted in funding for 7 large-scale projects with an estimated reduction potential of 72.88 million tonnes of carbon dioxide equivalent over the next 10 years. The Swedish public-private HYBRIT Demonstration project was granted support for the construction of a renewable hydrogen-based steel plant and a 500 MW electrolyzer. It also includes the installation of a photovoltaic cell factory, the capture of CO2 in cement, carbon capture and utilization for refineries, and the construction of a CO2 transport vessel. Altogether, the projects received EUR 1.146 billion in funds.[18]

Two disruptive events prompted the framework plan to take urgent action shortly after its launch. First, the impact of the SARS-CoV-2 pandemic on European economies led to the creation of a Recovery and Resilience Facility as part of the "Next Generation EU" programme, running from 2020-2026, in line with the European Green Deal. Resources totalled EUR 723.8 billion, distributed in grants and loans to EU Member States. Access to funding requires that 37% of expenditure contribute to climate change objectives, a target which, at 40%, is currently being more than met.[19]

Secondly, Russia's invasion of Ukraine and its effects on energy commodity prices, an event that hit the continent hard, resulted in the "REPowerEU"[20] initiative with the explicit aim of reducing dependence on Russian oil and gas. This initiative redoubled efforts in the field of energy transition in a number of objectives, especially: a) regarding clean hydrogen, to reach a production of 10 million tonnes by 2030, create an auction market by setting up the European Hydrogen Bank, use clean hydrogen for the decarbonization of 30% of steel production, and enable multinational public-private coordination and

[16] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_es [retrieved on April 14th, 2023]

[17] https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_es?etrans=es [retrieved on April 14th, 2023]

[18] European Commission, Directorate-General for Climate Action, (2022). Innovation fund progress report: report from the Commission to the European Parliament and the Council, August 2022, Publications Office of the European Union.

[19] https://ec.europa.eu/economy_finance/recovery-and-resilience-scoreboard/index.html?lang=es [retrieved on April 18th, April 2023]

[20] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/repowereu-affordable-secure-and-sustainable-energy-europe_es#energ%C3%ADa-limpia [retrieved on April 17th, 2023]

cooperation for research and development; b) to reach over 320 GW of newly installed solar photovoltaic capacity by 2025 and 600 GW by 2030; and c) a new target of 45% of renewable energy generation, i.e., a generation capacity of 1236 GW, by 2030.

Finally, a new measure called the "Green Deal Industrial Plan" was launched in February 2023 as a response to the United States' "Inflation Reduction Act" initiative, whose protectionist characteristics have prompted discussions by EU officials.[21] In this regard, the fourth pillar emphasizes "global cooperation and making trade work for the green transition, under the principles of fair competition and open trade".[22] In addition, it will seek to ensure the secure and sustainable supply of raw materials essential for the transition (lithium, cobalt, etc.) through the enactment of the Critical Raw Materials Act, seeking to reduce dependence on single country suppliers and secure the Union's access to resources. Thus, the initiative establishes: a) at least 10% of the EU's annual consumption for extraction; b) at least 40% of the EU's annual consumption for transformation; c) at least 15% of the EU's annual consumption for recycling; and d) no more than 65% of the EU's annual consumption of each strategic raw material at any relevant stage of processing may come from a single third country.[23] Finally, the plan seeks to enhance previous guidelines by simplifying regulatory frameworks and accelerating access to financing (e.g., by making it easier to obtain EU funds), among others.

It is apparent from a descriptive analysis of the initiatives surveyed that more than half of them involve grants, almost always awarded as offset funds for private contribution. Most of the other measures establish tax credit systems or provide preferential loans and/or guarantees. In terms of the kind of projects promoted, the category of renewable energies, which, in turn, includes various technologies, features the largest number of cases. However, initiatives usually support more than one transition channel, that is to say, they have a broad focus.

Most of the investment incentives described involve high-income countries, consistent with greater concern for environmental issues in these countries, as well as the greater availability of fiscal resources vis-à-vis emerging economies. The initiatives surveyed differ in attributes such as their level of sectoral and/or technological focus, the kind of companies they support and the extent of the resources allocated. Finally, it should be noted that some of them have been motivated not only by structural environmental concerns but also by the need to mitigate the effects of the Russia-Ukraine war on the prices and availability of fossil energy sources.

21 https://www.euronews.com/my-europe/2023/01/13/europe-wants-to-compete-with-the-us-on-quality-not-subsidies-warns-ursula-von-der-leyen [retrieved on April 12th, 2023]

22 https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/green-deal-industrial-plan_es#paragraph_33995 [retrieved on April 18th, 2023]

23 https://ec.europa.eu/commission/presscorner/detail/es/ip_23_1661 [retrieved on April 18th, 2023]

IV. THE CHALLENGES OF SUSTAINABLE PRODUCTIVE TRANSFORMATION IN LATIN AMERICA

IV.1. A COMPLEX PUBLIC POLICY PROBLEM

The problems of productive development, associated with productive transformation and the promotion of strategic sectors, involve an increasing number of dimensions. For instance, the development of a sector or product will most likely have to address several of the following issues simultaneously and seriously: education and training; the environment; science and technology; innovation; internationalization; infrastructure; new technologies; employment and labour relations; quality, technical standards and regulations; supplier development; funding; and competition, among others. The range of dimensions correlates with the need to involve multiple public and private stakeholders and pay special attention to coordination, collaboration and integration across policy areas. To ensure investment incentives are effective and their spillovers materialize, it is necessary to adopt a comprehensive approach to the problem of productive development.

The approach to PDPs or industrial policies taken in this study conceives of them as a learning and experimentation process supported by a broad strategic collaboration between the public and private sectors to determine the areas of intervention and the corresponding policies and instruments (Crespi et al., 2014; Fernández-Arias et al., 2010; Hausmann et al., 2008; Rodrik, 2004). Underlying this approach is the characterization of productive development as a complex public policy problem in which:

a) Multiple dimensions are involved – thematic areas, sectors, policies – whose interactions result in a level of complexity greater than that implicit in the number of dimensions.

b) The multiple interactions mean that one policy intervention can alter the effects of one or more other interventions, leading to unintended consequences (it is the interactions and not just the range of dimensions that define complexity).

c) It is necessary to consider different interests and, therefore, process different and possibly contradictory conceptualizations of the problem to be addressed.

d) It is usually impossible to know the precise nature of the problem beforehand and, consequently, it is unclear what the appropriate policy interventions are, and the outcomes of the process cannot be specified ex-ante (problems and appropriate interventions unfold as part of the policy process).

e) The design and implementation of policies, their objectives and goals are necessarily tentative or provisional, and design and implementation are subject to a recurrent reciprocal redefinition (an assessment of the implementation and subsequent adaptation of the design; both systematic).

f) The above points relate to a context of cognitive, strategic and institutional uncertainty.[24]

g) The complexity of the problem tends to exceed the capacity of a traditional organization with a hierarchical structure, and it is necessary to explore more flexible organizational arrangements with networking methodologies and, in general terms, collaboration as a strategy to deal with the underlying complexity better.[25]

[24] There is cognitive uncertainty due to the lack of information on and technical knowledge of the nature of the problems and their solutions (multiple causal relationships that are interrelated and hard to identify). There is strategic uncertainty due to the involvement of various actors with divergent and conflicting strategies resulting from their perceptions of the problem. There is institutional uncertainty because decisions are made at different political levels in a highly fragmented setting (van Bueren et al., 2003).

[25] As societies' problems become more complex, government responses must become more organizationally complex, which means moving away from traditional hierarchies and closer to collaborative, network-based approaches (Kettl, 2006).

Several authors agree that the problems currently facing policymakers have become more complex for a number of reasons: (i) greater political complexity resulting from the mobilization of a wider range of potentially divergent and even contradictory interests associated with an intensification of interactions[26]; (ii) greater technical and political complexity due to the larger number of dimensions that must be addressed simultaneously and constantly in a policy area; iii) a mismatch between the institutional and organizational structure of governments, with their multiple boundaries, and the problems that cut across jurisdictions, policy domains and levels of government; and iv) more intensive involvement of sensitive and potentially conflicting issues due to the values and interests involved, especially environmental issues. The fact that industrial policies are geared to the promotion of climate transition reinforces the characterization of productive development and the productive transformation involved in it as complex public policy problems.

IV.2. COMPLEXITY IN SUSTAINABLE PRODUCTIVE DEVELOPMENT

In order to consider the implications of sustainable productive development in terms of the institutional, methodological and capacity requirements for its treatment, it is important to focus the analysis on its characteristics as a public policy problem. This makes it possible to estimate the magnitude of the public policy challenge posed by climate transition for countries in the region, and see how far several of them may be from the minimum reasonable conditions for dealing with it.

It has rightly been argued that the policies selected should be consistent with the institutional capacities of the economy in the public and private sectors, and the policies and instruments chosen should be manageable, even if they are not the most efficient (Crespi et al., 2014). A suboptimal policy in an appropriate institutional context is preferable to an optimal policy in an inadequate one (Rodrik, 2004). However, in institutional environments that are weak in terms of the transformations that need to be promoted, such suboptimal policies and instruments may be too insufficient and it is essential and urgent to build the capacities that will make more sophisticated industrial policies progressively feasible. This is an aspect in which international cooperation with a regional approach can play a major role.

Ultimately, investment promotion aimed at climate transition and, therefore, structural transformation must be built into an overall strategy for sustainable productive development in which investment incentives are a potentially significant instrument and whose proper design and implementation require a profound change in the policymaking processes of countries in the region. This is basically a new way of working based on inter-institutional coordination and collaboration, multidisciplinarity, organizational flexibility, longer horizons and effective public-private dialogue in the context of a more innovation-friendly attitude. This poses a great challenge for governments and political systems, as it requires a very significant upgrade of capacities and a modification of deep-seated traditional behaviours which several previous attempts have failed to alter, and the contemplation of different organizational arrangements that can overcome policymaking inertia in areas or domains and can better address complexity.

IV.3 INCENTIVES FOR SUSTAINABLE PRODUCTIVE TRANSFORMATION IN LATIN AMERICA

The starting conditions in most countries in the region – characterized by moderately targeted, comparatively generous investment incentives – open up the opportunity for significant redesigned incentives in an investment promotion system designed to contribute to the transition to climate-resilient, carbon-neutral economies. This is feasible even in the context of fiscal restrictions, since the greater targeting of the instruments is consistent with their rationalization, i.e., there is greater effectiveness in terms of development goals together with a reduced impact on public finances. The levels of tax expenditure in several Latin

[26] Information and communication technologies have reduced or removed obstacles to interaction between actors and processes that were isolated in space or time, and interdependence has increased.

American countries suggest there are opportunities for and an interest in processing the aforementioned rationalization.

The overwhelming predominance of tax incentives in current programmes, coupled with the tensions to be expected in public sector finances, indicates that this prevalence will remain, since tax incentives imply a fiscal waiver rather than an outflow and, as long as they are not redundant, they do not imply a fiscal cost in the future.[27] However, international experience with the implementation of green incentives considered in this study has found a heavy presence of non-refundable support and grants. Although this survey is not exhaustive, its content suggests the relevance of considering the potential effectiveness of different kinds of both tax and financial incentives.

The relevance of and need for a reformulation of investment incentive systems in the region are not only due to the requirements of climate transition. To a greater or lesser extent depending on each national case, there are several additional reasons why a comprehensive review of these instruments is necessary:

a) Incentive programmes usually fail to reflect in their design and implementation mechanisms some of the widely accepted best practices, such as making foundations and objectives explicit, implementing monitoring and assessment activities, making programmes and incentives time-bound, and periodically reviewing the inducements offered, among others. Appendix 3 presents and briefly describes a non-exhaustive list of best practices for the design and implementation of investment incentives. A widespread improvement in the quality of the instruments is necessary for improved management of more sophisticated incentives such as green incentives.

b) The incentive programmes are dominated by tax incentives and include extensive use of tax holidays – full or partial Corporate Income Tax exemptions – so their effectiveness may be affected to some extent by the global tax reform of the Inclusive Framework on BEPS, in particular, with the establishment of a minimum effective tax rate on corporate income. Even if no significant effects are anticipated in the current situation, the redesign of the incentive programmes should prevent possible future revenue losses associated with attracting investments.

c) There are relatively frequent cases of very long-standing promotional schemes that have not been updated, and there has been no assessment of the wisdom of their continuity or the requirements and conditions for their continuity. There are several widely used schemes whose characteristics point to significant levels of redundance. One particularly usual type is schemes providing incentives of little significance and, therefore, limited impact on investment decisions and the intended behaviours.

d) The post-pandemic international context has accelerated the trend towards the regionalization of global value chains given the concern of governments and multinational companies over their vulnerability, with the resulting opportunities to attract investment and/or expand exports.

e) Apart from the commitments resulting from the national climate change mitigation and adaptation strategy, the adjustment of the incentives and institutional support of sustainable development policies may be motivated by compliance with environmental requirements in the target markets of exports or the requirements for access to funding in terms of sustainable finance.

The reformulation of incentives should not be limited to building offsets or green requirements into existing programmes. A profound redesign should be undertaken based on the assessment of relevance, opportunity and conditions for their continuity, reform or termination, and the possible introduction of new instruments. It

[27] A redundant incentive is one that does not affect the investment decision, as the investment would have been made even in the absence of the incentive (it is a waste of resources). If the incentive is not redundant, the fiscal waiver does not imply a fiscal cost attributable to the application of the incentive because there would be no revenue to waive in the absence of the incentive.

is also necessary to consider alternative uses of the resources allocated to incentives, both as part of investment promotion and in other significant areas of the national environmental strategy.

Although the redesign of the investment incentive system will depend on the specific situation in each country, it is possible to identify a range of possible programme contents that will help to define a reformulated system geared to climate transition (in line with Diagram 1):

a) Investment incentives, both general and sectoral in scope, with requirements in terms of energy efficiency, reduction of greenhouse gas emissions or climate change adaptation which must be met by machinery and equipment, industrial plants, buildings and other facilities involved, essentially aimed at the acquisition, construction, replacement or reconversion of existing equipment and facilities.

b) Incentive programmes for investment in activities that are the main national sources of emissions for the purpose of incorporating technologies and behaviours that will contribute to reducing such emissions. These are major economic activities for the national economy whose continuity and possible expansion are necessary but under environmental impact conditions unlike those previously observed, and in line with the goals of the national environmental strategy. They typically involve certain agricultural, industrial and transport and logistics subsectors.

c) Incentive programmes for investment in the production of electricity from renewable sources, biofuel production, carbon capture and storage projects, low-emission, high-productivity activities, and activities in clean technology chains (including the production or assembly of specific components), as well as in efficient solid waste management and circular economy and waste recovery mechanisms. For instance, some of the region's countries have been successful in promoting business services in exports, a low-emissions activity that requires international competitiveness and has the potential to incorporate knowledge progressively. Furthermore, since tourism is a significant sector in most of the region's countries, investment incentive programmes in several of them are opening up opportunities to expand sustainable tourism combined with the conservation of natural and historical heritage resources.

d) Incentive programmes that provide support for business partnerships as a mechanism to enable investments in climate change mitigation and adaptation which are beyond the capabilities of individual companies but can be achieved through the cooperation of producers in the same line of business and/or region. Examples of the above are irrigation systems, power plants for the production of electricity from renewable sources for self-consumption and other infrastructure that can be shared and requires a modest scale. The concept also applies to issues such as sectoral statistical information systems and joint research and innovation projects.

Incentives for R&D spending on technological innovations in products (goods and services) and/or processes that will contribute to climate change mitigation and adaptation. Several Latin American countries are implementing horizontal tax credits for a percentage of R&D expenditure, which could incorporate some particular consideration for environmental issues. In turn, some countries have research and innovation agencies that implement subsidy programmes for R&D activities, in which sectoral prioritization is usual.

The suggested guidelines are based on the assumption that investment incentives conditioned by specific offsets and requirements can potentially contribute to climate transition by influencing the technologies used, the sectoral structure of production, and certain producer behaviours. As noted previously, as a rule of thumb, the effectiveness of green requirements and offsets depends on their being a necessary condition for access to benefits in that they avoid programmes that may have some kind of green component but allow substantive benefits without satisfying that component. As a general rule, exceptions may apply. For instance, it would be unreasonable to condition any benefit to R&D expenditure on its orientation to

environmental matters (but it would be reasonable in the case of energy efficiency standards in the acquisition of machinery and equipment).

The redesign of investment incentives aimed at promoting climate transition implies a departure from one of the usual basic criteria of traditional incentive systems, namely, the bias towards the promotion of green field investment projects or those that determine a significant increase in the production capacity of companies in operation. To the extent that conversion to technologies that reduce greenhouse gas emissions is also desirable, the expansion of production capacity is not a necessary condition, and an incentive that promotes the replacement of machinery and equipment, the reform and adaptation of facilities, the change of energy supply sources or the replacement or reuse of inputs or raw materials is well-founded as long as the upgrade leads to reduced emissions or greater capacity to adapt to climate change.

The intended sustainable productive transformation is a long-term, permanent and cumulative process that far exceeds a government's term of office. In more general terms, climate change mitigation and adaptation policies require commitments to achieving goals several years or even decades in the future. This characteristic calls for the consolidation of a State policy on sustainable productive development that requires political and organizational stability to operate with broad horizons, safe from changes in key public authorities and, especially, post-electoral reorganizations (Crespi et al., 2014). Although this is an obvious need, it is also clear that it clashes with the usual behaviours in the region, which has traditionally suffered from a "refoundation syndrome", whereby each new administration refutes the policies and programmes of the previous ones and introduces new ones without assessing what worked and what did not in their predecessor's administration (Machinea, 2005). The institutional arrangement that will be addressed below should consider this situation, with effective public-private coordination being a mechanism that promotes political and organizational stability between administrations, as it secures the private sector's commitment to investing time and resources.

As mentioned previously, the practical consequence of redesigning incentive programmes with a broad sectoral scope and no environmental requirements, as is the case in most Latin American countries, is not so much that incentives will be given to projects that contribute to climate transition but that they will no longer be given to projects that do not. The reformulation of investment incentives therefore implies withdrawing benefits or making access to them more expensive as part of a prioritization of sectors, activities or behaviours. These issues can motivate lobbies and require a high degree of legitimacy and priority of climate transition on government agendas as a condition for aligning public and private stakeholders and securing medium- and long-term commitments.

The process of developing sustainable productive development policies is apt to cause some tension between policy areas focusing on productive development and those focusing on the environment. This tension should not be a matter of concern as long as the institutional mechanisms are in place to defuse it and overcome any possible deadlocks. In other words, this is another aspect that an institutional arrangement must expressly anticipate. However, the interaction between productive development and environmental policies does not necessarily imply conflicting objectives. On the contrary, their intersection is, for instance, a source of opportunities for innovation in more sophisticated products aligned with the requirements of consumers with more purchasing power.

Some of the above points refer directly to the features or requirements of the institutional arrangement for sustainable productive development policies containing green incentives, that is, political and organizational stability, prioritization on the government agenda and integration between productive development and environmental policies.

At several points in this study, institutional aspects have been highlighted as key pillars of sustainable productive transformation and, more broadly, the climate transition process. It is believed that a correct definition of actions and objectives is not enough since an unstable institutional arrangement would hamper

them (apart from the fact that it might also preclude the definition of suitable policies). It has been pointed out that the reformulation of investment incentives for a climate transition calls for far greater public policy design and implementation capacities than those implicit in the mechanisms currently in place with relatively limited targeting (as also clearly evidenced by the content of Appendix 3). Therefore, capacity building in both the public and private sectors must be a component of the sophistication of investment promotion instruments aimed at sustainable productive transformation. No significant progress can be expected in situations with suboptimal policies, even if they are consistent with the limited existing capacities.

From a broader perspective, it is necessary to establish a more flexible organizational arrangement in the public sector in order to generate the public-public and public-private coordination required to address a problem that cuts across jurisdictions, policy domains and levels of government (In particular, public-public coordination must be adequately resolved for effective public-private coordination). Of course, this new arrangement does not imply restructuring the institutional organization of the public sector. This kind of reform would lead to improvements in the margin that would not justify the political and other resources required to carry them out. Hardly any organizational structure is able to address all the different complex public policy problems at the same time. The solution lies not in reforming the structures but in promoting policy processes between areas or domains; more particularly, in making these fragmented structures work together. Coordination is unlikely to emerge spontaneously with the necessary intensity, so specific policy initiatives are required for focusing specific policy initiatives on the crosscutting nature of certain problems and promote inter-institutional collaboration.[28]

Finally, although the transition to overhauled policies will be determined by the features of each of the countries, it is advisable to identify opportunities for regional cooperation based on the basis of problems that may be common to several of them. For instance, the treatment of underdeveloped and socially significant agricultural subsectors, capacity building and the reformulation of free trade zone regimes or other similar regimes.

V. IN SUMMARY

In recent decades, most Latin American countries have tried to promote productive transformation processes aimed at diversifying and raising the levels of complexity of their economies, often with a focus on exports, especially in the smaller countries. In this attempt, they have usually resorted to productive development policies and, within them, investment incentives. The results of these initiatives have been mixed. The failed or truncated cases have almost always been the result of flaws in the way such initiatives were designed, implemented and/or managed, or a failure to anticipate the risks involved in their adoption. Other initiatives fell victim to the economic and institutional instability that characterizes several Latin American countries.

Today, in addition to the traditional goals of productive transformation in the region, there are new goals related to sustainability. This means that the transformation processes promoted by the State must be aligned with not only that goal but also with active promotion of the climate transition process. The right public policy instruments to achieve these objectives are not very different in their nature from those of the traditional productive development policy, so investment incentives are part of the toolkit that is available to decision-makers seeking to incorporate sustainability dimensions.

[28] This involves turning to one of the organizational figures for the coordination of public policies, such as cabinets or ministerial commissions, together with an agency responsible for coordination activities, which, together with the entities with the corresponding competencies, will contribute to the identification of opportunities for collaboration and provide support for the various coordination activities required.

Some conceptual arguments and incipient international evidence can help guide policymakers when making decisions on the incorporation of "green" incentives. Studies on some experiences are also available that could contribute to a better design, implementation, management and assessment of the results of their application. At any rate, the challenge is enormous, since the complexity and uncertainty inherent in the problems of productive transformation is compounded by those of climate transition. The work of turning traditional practices into incentive policies requires, among other things, high levels of inter-institutional cooperation, which has been hard to achieve in the fragmented governmental structures typical of the countries in the region. As a result, this is not just about correctly identifying the problems to be addressed and the best solutions to mitigate them, but mainly about embarking upon a process of thorough institutional redesign that will contribute to arrangements promoting flexibility and coordination between the various government areas involved in the challenge of sustainable productive transformation.

Finally, a factor that has often worked against the success of productive development policies is the absence or weakness of the capacities required to manage them adequately throughout the different stages of their life cycle. This can be used as an argument to avoid adopting complex instruments aimed at ambitious sustainable productive transformation objectives. On the contrary, the challenges posed should be met with greater investments in capacity building, which will enable these complex instruments to be implemented effectively. As noted previously in this paper, no significant progress can be expected in situations with suboptimal policies, and with no significant progress in the area of sustainable productive transformation, the countries in the region and their populations are doomed to become stuck in the middle-income trap and will be increasingly exposed to the potentially dramatic effects of climate change.

BIBLIOGRAPHY

Altenburg, T., & Rodrik, D. (2017). Green industrial policy: Accelerating structural change towards wealthy green economies. In T. Altenburg & C. Assmann (Eds.), *Green Industrial Policy. Concept, Policies, Country Experiences*. Geneva, Bonn: UN Environment; German Development Institute / Deutsches Institut für Entwicklungspolitk (DIE).

Candel, J. J. L., & Biesbroek, R. (2016). Toward a processual understanding of policy integration. *Policy Sciences*, *49*(3), 211–231. https://doi.org/10.1007/s11077-016-9248-y

Cornick, J. (2013). The Organization of Public-Private Cooperation for Productive Development Policies. *IDB Working Paper No. 437*. Washington, DC: IDB.

Cornick, J. (2016). Productive development policies in Latin America: Recent discussions, job creation and the ILO. *ILO Americas Technical Reports 2016/5*. Lima: ILO Americas.

Crespi, G., Fernández-Arias. E., & Stein, E. (Eds) (2014) Bank, I. D. (2014c). *Rethinking productive development: Sound policies and institutions for economic transformation*. Development in the Americas series. IDB. Springer. https://doi.org/10.1057/9781137393999

Devlin, R., & Moguillansky, G. (2011). *Breeding Latin American tigers: Operational principles for rehabilitating industrial policies*. Santiago de Chile: ECLAC.

Fernández-Arias, E., Agosin, M., & Sabel, Ch. (2010). Industrial policy in Latin America: ghost or phoenix? In: C. Pagés (Ed.), *La Era de la Productividad: Cómo Transformar Las Economías Desde Sus Cimientos*. Development in the Americas Series. Washington, D.C.: IDB.

Galindo, L.M., & Lorenzo, F. (2023). Desafíos fiscales y financieros de la transición climática en América Latina. *Working Paper 1 of the Red Sur project "Promoting a pandemic recovery: Evidence to support managing the growing debt crisis",* developed with the support of the International Development Research Centre (IDRC-Canada). May.

García, P., López, A., & Ons, A. (2021). *Las políticas hacia la inversión extranjera directa.* Inter-American Development Bank, Washington DC.

Hausmann, R., Rodrik, D., & Sabel, C.H. (2008). Reconfiguring industrial policy: A framework with an application to South Africa. *Working Paper No. 168*. Cambridge, MA: Center for International Development, Harvard University.

Imbs, J., & Wacziarg, R. (2003). Stages of Diversification. *The American Economic Review*, *93*(1), 63–86. https://doi.org/10.1257/000282803321455160

Klinger, B., & Lederman, D. (2004). Discovery and development: An empirical exploration of "new" products. *World Bank Policy Research Working Paper 3450*. Washington, D.C.

Machinea, J. L. (2005). Competitiveness and welfare: balancing the short and long term. In: *Las visiones de país importan: Lessons from successful development experiences*. International Institute for Democracy and Electoral Assistance, Washington, D.C.: World Bank/ECLAC.

May, P., Jochim, A., & Pump, B. (2010). *Boundary spanning policies problems: politics and policymaking*. American Political Science Association (APSA) Annual Meeting, Washington DC, September 2-5.

Melo, A., & Rodriguez-Clare, A. (2006). Productive development policies and supporting institutions in Latin America and the Caribbean. *Research Department Competitiveness Studies Series Working Paper No. C-106*. Washington, D.C.: IDB.

OECD (2013). *Perspectives on Global Development 2013: Industrial Policies in a Changing World.* Perspectives on Global Development series. Paris: OECD Publishing.

ILO (2014). *Global Employment Trends 2014: Risk of a jobless recovery?* Geneva: ILO.

Ons, A. (2016). Analysis of investment promotion instruments: the case of Uruguay. In P. M. García (Ed.). *IDB Technical Note No. 1086*. Washington, DC: IDB.

PAGE -Partnership for Action on Green Economy- (2017). *Green Industrial Policy and Trade: A Tool-Box*.

Pack, H., & Saggi, K. (2006). Is there a case for industrial policy? A critical survey. *The World Bank research observer*, *21*(2), 267-297. https://doi.org/10.1093/wbro/lkl001

Rodrik, D. (2004). Industrial policy for the twenty-first century. *KSG Faculty Research Working Paper No. 04-047*. Cambridge, MA. http://dx.doi.org/10.2139/ssrn.617544

Rodrik, D. (2008). Normalizing Industrial Policy. *Commission on Growth and Development Working Paper Num. 3*. Washington, DC: World Bank.

Salazar-Xirinachs, J. M., Nübler, I., & Kozul-Wright, R. (2014). Industrial policy, productive transformation and jobs: Theory, history and practice. In: J. M. Salazar-Xirinachs, I. Nübler and R. Kozul-Wright (Eds.), *Transforming economies: Making industrial policy work for growth, jobs and development*. Geneva: ILO.

Thomas, K.P. (2011). *Investment incentives and the global competition for capital*. Springer. https://doi.org/10.1057/9780230302396

UNCTAD (2000). *Tax incentives and foreign direct investment: A global survey*. New York and Geneva: United Nations.

UNCTAD (2003). *World investment report. FDI policies for development: National and international Perspectives*. New York and Geneva: United Nations.

van Bueren, E.M., Klijn, E.H., & Koppenjan, J.F. (2003). Dealing with wicked problems in networks: Analyzing an environmental debate from a network perspective. *Journal of Public Administration Research and Theory, 13*(2), 193-212. https://doi.org/10.1093/jpart/mug017

WTO (1996). *Trade and foreign direct investment*. Press 57. Genoa: World Trade Organization.

APPENDIX 1: MAIN TAX INCENTIVES: TAX HOLIDAYS, TAX CREDITS, INVESTMENT ALLOWANCES AND ENHANCED DEDUCTIONS

Instrument	*Advantages*	*Disadvantages*	*Alternatives/Comments*
Reduced general corporate income tax rate	▪ Limited tax planning possibilities (less tax evasion and avoidance). ▪ Minimizes distortion in resource allocation (market determines profitable investments). ▪ Avoids several disadvantages of tax holidays. ▪ Simplicity that benefits the general investment climate.	▪ Increased risk of revenue loss (due to investments that would be made anyway). ▪ Beneficial for highly profitable investments (which would be made anyway). ▪ Existing investments will also benefit ▪ Not possible to aim investments at priority objectives. ▪ Term of benefits is indefinite.	▪ Strictly speaking, this is not a tax incentive since there is no deviation from the general tax regime.

Instrument	*Advantages*	*Disadvantages*	*Alternatives/Comments*
Tax holidays *Full or partial exemption from Corporate Income Tax for new investments or expansions of existing companies for a certain period.*	▪ Simple for the public sector to administer. ▪ Relatively low compliance costs for the private sector.	▪ Fiscal waiver / benefit amount: a) has no limit; b) may be hard to estimate; c) is independent of the investment amount and benefits to the host country. ▪ In contexts of uncertainty, even the investor may have trouble estimating the benefit, which reduces the effectiveness of the incentive (it may be reduced or zero). ▪ They especially attract footloose (easy to relocate) investments once the incentives have been exhausted. ▪ They discriminate against long-term investments making losses in the first years (they benefit investments with substantial profits in the first years in non-capital-intensive sectors). ▪ They may increase the tax burden if losses during the tax holiday cannot be offset in the next period. ▪ Heavier tax revenue losses compared to more targeted incentives. ▪ They are susceptible to misuse by other firms to pay less tax. ▪ Greater likelihood of redundancy if they reach investments in existing companies.	▪ The actual benefits are determined by the moment at which the incentive period begins. Options: a) together with production; b) in the first year with positive net income; c) in the first year in which the accrual is a positive net income; ▪ If the depreciation is deferred to the period after the tax holiday, an additional tax reduction is granted. ▪ If forward compensation of losses incurred during the tax holiday is authorized, the instrument may be attractive to firms with long gestation periods. ▪ It is good professional practice to require investors to keep accounting records during the tax holiday period.

Instrument	*Advantages*	*Disadvantages*	*Alternatives/Comments*
Investment allowances *Deduction of a percentage of eligible investment expenses from net taxable income* *Tax credits* *Corporate income tax deduction of a percentage of eligible investment expenses* *Accelerated depreciation* *Application of higher rates than under the general depreciation regime for the acquisition or construction of fixed assets*	▪ There is a benefit only if there is capital investment. ▪ Fiscal waiver / benefit amount: limited by the investment amount. ▪ Certainty about the maximum benefit amount. ▪ Annual usage may be limited so that a percentage of Corporate Income Tax must be paid. ▪ They support the expansion of existing companies with income from ongoing operations. ▪ The definition of eligible expenses helps to target incentives at intended activities and minimize costs.	▪ These incentives are less conducive to job creation. ▪ The higher the deduction percentage, the less the incentive for companies to control their costs and the greater the opportunity for evasion. ▪ Greater likelihood of redundancy if they reach investments in existing companies. ▪ May discriminate against investments with long gestation periods according to provisions on loss compensation, incentive carryforwards and alternative applications.	▪ A critical point is the treatment of benefits that cannot be used in the year in which the right is generated because the income is insufficient. Options: a) carrying forward any unused balances; b) using the excess to pay other taxes; c) refunding unused credit after a certain period of time.
Increased deductions *Deduction for more than 100% of eligible expenses*	▪ Targeted promotion of certain activities and behaviours (R&D&I, capacity building, among others).	▪ Certain expenses may be due to the needs of the business (redundancy).	▪ An incremental approach can be taken: a percentage of the expenditure in one year in excess of some base (in general).

Source: Devised by the authors based on García et al. *(2021)*

APPENDIX 2: INCENTIVES FOR INVESTMENT IN ACTIVITIES ASSOCIATED WITH THE GREEN TRANSITION

Country	*Title*	*Policy*	*Transition*	*General Objective*	*Mechanisms/Design/Targeting+*
Argentina	Green Productive Development Plan: Green SMEs	Grants	Several	Promote environmental sustainability and the entry of SMEs into the green economy.	Non-repayable contributions (NRCs) covering a maximum of 70% of sustainable development and eco-innovation projects.
Argentina	Green Productive Development Plan: Programa Soluciona Verde	Grants	Several	Environmental sustainability projects related to the Knowledge Economy, including: circular economy, renewable energies, energy efficiency improvements, reduction in resource consumption and waste, reduction in emissions of pollutants, environmental management systems.	NRCs of up to 80% of total project cost.
Australia	Renewable Hydrogen Deployment Funding Round	Grants	Renewable energies	Funding for projects that help accelerate the commercialization of green hydrogen.	NRCs of up to 50% of total project cost.
Australia	Energy Efficient Communities Program	Grants	Equipment replacement and energy efficiency	Grants for energy-intensive companies.	AUD 25M for energy-saving projects by companies consuming up to 0.05 petajoules a year.
Australia	Modern Manufacturing Initiative - Recycling and Clean Energy projects funding	Grants	Several	Funding for projects whose objectives include an increased use of green energy and recycled inputs.	Grants of between AUD 1 and 20 million for as much as 50% of eligible expenses.
Austria	Energy management systems in SME	Grants	Energy efficiency	Funding for SMEs to introduce improvements in their energy management systems.	Matching funds for contracting consultancies, with ceilings by stage and type of project.
Austria	National Environmental Fund	Grants	Renewable energies and equipment replacement	Grants for energy saving and CO2 emission reduction projects.	Grants of up to 30% of expenses for projects aimed at energy saving, emission reduction and substitution of fossil energies.

Country	*Title*	*Policy*	*Transition*	*General Objective*	*Mechanisms/Design/Targeting+*
Austria	Green investments	Grants	Several	As part of the COVID recovery package, a programme was introduced to support investments in renewable energy, energy efficiency and CO2 reduction.	Grants covering up to 14% of the cost of investment in activities promoted by the programme.
Canada	Investment tax credit for carbon capture, utilization and storage (CCUS)	Tax credit	Carbon capture	Encouragement of CCUS projects that permanently store captured CO2 by means of dedicated geological storage or CO2 storage in concrete.	Tax credit for up to ▪ 60% for investment in CO2 capture equipment in direct air capture projects. ▪ 50% for investment in CO2 capture equipment in the rest of CCUS projects. ▪ 37.5% for investment in transport, storage and use equipment.
Canada	Emissions Reduction Fund	Loans	Emissions reduction	CAD 750 million fund to help companies in the hydrocarbon sector to reduce methane and other GHG emissions	▪ CAD 75M for R&D and emissions reduction projects in offshore activities. ▪ CAD 75M to support the onshore hydrocarbon sector to reduce the venting of methane. ▪ Funds for emissions reduction projects are repayable, while those for phase-out projects are partially repayable. ▪ Coverage of up to 75% of eligible expenses
Canada	Wind Energy Investment	Grants	Renewable energy and equipment replacement	Replacing diesel with wind energy in northern Quebec.	CAD 7M funding for TUGLIQ Energy Co. to develop the third phase of its wind energy project.
Chile	Energize your SME	Grants	Renewable energies	Funding for energy efficiency and renewable energy projects for self-consumption in SMEs.	Co-funding of investment projects for SMEs, with ceilings distributed as follows (maximum CLP 15 million): ▪ Medium-sized: 50% of the investment cost. ▪ Small: 70% of the investment cost. ▪ Micro: 80% of the investment cost.

Country	*Title*	*Policy*	*Transition*	*General Objective*	*Mechanisms/Design/Targeting+*
China	Carbon Peaking	Loans	Renewable energies	Accelerate the development of renewable energies in China.	▪ Loans of up to 100 billion yuan for photovoltaic, marine and other renewable energy generation. ▪ Issuance of a green bond by the China Development Bank to fund decarbonization projects.
China	Circular on Adjustments of VAT Treatment to Products and Services Output through Comprehensive Utilization of Resources	Tax exemption and refund	Waste recycling and management	Encouraging the reuse of waste from industrial processes.	▪ VAT exemption for sand and gravel from construction waste ▪ VAT exemption for waste treatment services. ▪ VAT refund (between 50% and 100%, depending on the case) for sales of various products made out of waste from production processes (including electricity and heating).
Colombia	Tax incentives for investments in renewable energies	Tax credit, tax exemptions, accelerated depreciation	Renewable energies	Promotion of projects associated with renewable energies in their different stages (R&D, pre-investment, investment, operation).	Benefits include: ▪ Deduction from taxable income for 50% of the investment for 15 years. ▪ Accelerated appreciation regime for machinery, equipment and civil works up to a global annual rate of 20%. ▪ VAT exemption on the import (and purchase) of (national and imported) equipment, elements and machinery, including services. ▪ Tariff exemption on machinery, equipment, materials and supplies that are not produced domestically and can only be acquired through import.
Denmark	Subsidy scheme private enterprises	Grants	Energy efficiency	Funding for energy-saving projects in the productive sector, with the main focus on process energy, through public bids.	▪ Grants are awarded to the proposals with the lowest costs per saved kWh. ▪ Grants cover 30% to 50% of the project, depending on the size of the company, with a maximum of DKK 15 million per project.

Country	*Title*	*Policy*	*Transition*	*General Objective*	*Mechanisms/Design/Targeting+*
Denmark	Business Pool	Grants	Equipment replacement	Grants of up to 50% for energy-saving projects (e.g., replacement of gas boilers with heat pumps, heat recovery systems and process energy optimization).	▪ Up to 7 cents per saved KWh during the life of the Project. ▪ Up to 50% of the costs, depending on the size of the company. ▪ Maximum limit of EUR 15 million.
Finland	Energy Aid Scheme	Grants	Renewable energies	Promotion of investment projects and studies on renewable energies and energy efficiency.	Investment subsidy of up to 30% for mature technologies and up to 40% for new technologies. Includes production of renewable energy; energy savings or more efficient production or use of energy; waste heat recovery; decarbonization of energy systems.
Finland	Growth Engine	Grants and loans	New technologies	Funding of disruptive collaborative projects targeting the global market.	Grants and loans in the areas of carbon offsets, smart port and marine services, and scale projects on renewable energy production
Hungary	Hungarian Green Champion Programme	Grants	Several	Support for SMEs to invest in low-carbon technologies, energy efficiency, recycling, electromobility and water management.	Funding for a total of HUF 30 billion through repayable support for up to 50% of the project, with a maximum of HUF 1.5 billion per project.

Country	*Title*	*Policy*	*Transition*	*General Objective*	*Mechanisms/Design/Targeting+*
India	Scheme to Support Promotion of Biomass-Based Cogeneration in Sugar Mills and Other Industries	Grants	Renewable energies	Plan to support the promotion of biomass-based cogeneration in sugar mills and other industries, including projects that use bagasse, agro-based industrial residue, crop waste, wood produced through energy plantations, weed, wood waste produced in industrial operations, etc. as biomass.	▪ Bagasse projects: Rs.25 Lakh / MW. ▪ Non-bagasse projects: Rs.50 Lakh / MW.
India	Production-Linked Incentives	Grants	Several	Direct subsidies of 4%-6% on incremental sales in sectors prioritized by the government	Prioritized "green" sectors: ▪ Solar panels ▪ Advanced chemistry cells for lithium batteries.
Indonesia	Green Recovery Initiatives: Waste Sector	Loans	Recycling and waste management	Support for 7,500 MSMEs to improve their waste management systems, reduce their costs and improve the supply of waste to large companies.	Preferential loans to MSMEs for 5 years for working capital and 10 years for investment capital, both with a one-year grace period.
Israel	Infrastructure projects	Guarantees	Renewable energies	Expansion of renewable energy infrastructure	ILS 500 million government guarantee fund for solar energy investments
Japan	Tax system for promoting energy efficiency	Tax credit, accelerated depreciation	Energy efficiency	Promotion of energy efficiency investments	▪ Energy efficiency operators benefit from accelerated depreciation (30%) of their energy efficiency investments ▪ SMEs investing in energy-saving systems benefit from 7% tax credit
Korea	Green Guarantee Business	Guarantees	Renewable energies	Agreement between the Korea Energy Agency, the Credit Guarantee Fund and the Technology Guarantee Fund to improve credit conditions for renewable energy companies.	▪ Credit valuation based on carbon reduction impacts rather than the assessment of technical capabilities and/or existing credit conditions. ▪ Collateral ratio increased from 85% to 95%. ▪ Fee reduced from 1.2% to 1%. ▪ Interest rate reduced from 0.9% to 2.83% on average.

Country	*Title*	*Policy*	*Transition*	*General Objective*	*Mechanisms/Design/Targeting+*
Korea	Support to SMEs for the development of green technologies	Grants	Several	KRW 31.9 billion fund to promote the creation of an ecosystem (including dedicated areas) to foster green startups	Includes: ▪ KRW 500 million to build a 'Green Startup Town' that combines green/digital support infrastructure for innovative businesses and an improved residential/cultural environment through urban regeneration ▪ Grants to support the entire growth cycle of as many as 100 startups leading the Green New Deal.
Netherlands	Tax allowances for environmental improvement projects	Tax credit, accelerated depreciation	Several	Promotion of investment projects for a series of activities defined as environmentally friendly.	▪ Income tax deduction of between 27% and 45% of investment cost ▪ Possibility of depreciation of up to 75% of the investment when investor decides.
Netherlands	Sustainable energy transition subsidy scheme (sde++)	Grants	Renewable energy and carbon capture	Funding of renewable energy projects, CO_2 emission reduction and carbon capture	Grants whose amount depends on the technologies used and the reduction of CO_2 emissions achieved. Maximum of EUR 400 per tonne of CO_2 reduced.
New Zealand	Government Investment in Decarbonizing Industry Fund	Grants	Renewable energy, energy efficiency and equipment replacement	Co-investment fund for projects promoting the decarbonization of the industrial sector, with a focus on heat generation processes.	▪ Grants cannot exceed 50% of project cost. ▪ Sets minimum (500,000) and maximum (5,000,000) grant amounts.
Norway	Green Platform	Grants	Several	Funding of innovative projects on green growth technologies for value chains, from R&D to scaling and commercialization.	▪ Funding of up to NOK 300 thousand for pre-projects (covering up to 100% of eligible costs). ▪ In Step 2, funding will be available for three-year projects requiring over NOK 50 million.

Country	*Title*	*Policy*	*Transition*	*General Objective*	*Mechanisms/Design/Targeting+*
Portugal	Subsidies for solar panels installation in agribusiness	Grants and tax incentives	Renewable energies	Contain the rise of energy and food prices	▪ Grants of up to EUR 200 thousand per project. ▪ Reduction of minimum VAT rate (6%) for the acquisition of panels.
Portugal	Support For the Production of Hydrogen and Other Renewable Gases	Grants	Renewable energies	Funding of investment projects aimed at gas production from renewable sources	NRCs of up to EUR 5 million (increasing to EUR 10 million depending on the level of integration within the value chain) and with co-funding of up to 100% of eligible costs.
South Africa	AFD Green Fund	Loans	Renewable energies and energy efficiency	Funding for renewable energy (focusing on solar and biomass) and energy efficiency projects.	▪ Maximum ZAR 250 million per project ▪ Cap of Prime + 1.6% or an equivalent fixed rate ▪ Minimum investment period of 3 years

Country	*Title*	*Policy*	*Transition*	*General Objective*	*Mechanisms/Design/Targeting+*
Spain	Energy efficiency aid programme for the industrial sector	Grants	Equipment replacement and energy efficiency	Investment funding for SMEs and large companies seeking to implement energy saving and energy efficiency systems.	EUR 378 million for grants ranging from 30% to 65% of the projects (depending on company size and region) for the following purposes: ▪ Renovation of steam and hot water production systems. ▪ Motor regulation by means of electronic variable speed drives. ▪ Replacement of lighting systems with LEDs. ▪ Boiler upgrading through burner replacement and heat recovery. ▪ Waste heat recovery. ▪ Replacement of plastic injection moulding machines. ▪ Energy optimization in industrial refrigeration. ▪ Improvement of energy efficiency in textile finishing processes. ▪ Replacement of air compressors with high-efficiency equipment
Sweden	Industry Leap Programme	Grants	Emissions reduction	Reduce carbon footprint in industrial processes. In 2018-2019, 23 projects received EUR 65.6 million in funds.	▪ Funding of up to 40% (+10/20% more for SMEs) of eligible costs for new investments ▪ Funding of 25% to 100% of R&D depending on the project.
United Kingdom	Clean Growth Fund	Funding (Venture Capital)	Energy efficiency and new technologies	GBP 40 million fund as venture capital for green start-ups aiming to raise private capital.	Funding of start-ups with innovative projects in: energy storage and smart grid systems; renewable heating technologies across homes and commercial buildings; biofuels and bio-energy systems.
United Kingdom	Regional funding for cutting emissions	Grants	Renewable energy and carbon capture	GBP 8 million funding for six UK regions to create net-zero emission industrial zones by 2040	Funding CCUS and low-carbon hydrogen production projects

Country	*Title*	*Policy*	*Transition*	*General Objective*	*Mechanisms/Design/Targeting+*
United Kingdom	Industrial Energy Transformation Fund (IETF) Phase 1	Grants	Renewable energy and equipment replacement	GBP 40 million fund for companies in energy-intensive sectors, including pharmaceuticals, steel, paper and food and drink	Grants of at least GBP 100,000 for projects on energy efficiency, energy substitution or cleaner energy generation.
United Kingdom	Green transition in heavy industry	Grants	Several	Funding programme to support green transition in heavy industry	▪ GBP 139 million for transition from natural gas to hydrogen and to scale CCUS technology ▪ GBP 149 million for projects introducing green technology ▪ GBP 26 million to reduce emissions in the construction industry.
United States	Section 45Q Credit for Carbon Oxide Sequestration	Tax credit	Carbon capture	CCUS project funding	Tax credit per tonne of carbon sequestration of up to: ▪ USD 85 for permanent storage on land ▪ USD 60 for use in oil recovery and other industrial applications ▪ USD 180 for direct air capture ▪ USD 130 for direct air capture and reuse.
United States	Renewable Electricity Production Tax Credit (PTC)	Tax credit	Renewable energies	Increased renewable energy production capacity.	▪ Tax credit for each kWh generated through eligible energies for the first 10 years of operation. ▪ Wind, closed-loop biomass and geothermal energy: USD 0.026/kWh ▪ Other eligible energies: USD 0.013/kWh.
United States	Business Energy Investment Tax Credit (ITC)	Tax credit	Renewable energies	Introduction of renewable energy generation systems in the agricultural, industrial, commercial and utility sectors.	Tax credit amounting to 6% to 30% of the investment in new technologies depending on local content, employment generation and the community's income level.
United States	New Clean Hydrogen Production Tax Credit	Tax credit	Renewable energies	Funding for green hydrogen projects beginning construction before 2033. USD 7 billion fund.	Tax credit of USD 60 cents for 10 years for every kilogram of clean hydrogen produced.

Country	*Title*	*Policy*	*Transition*	*General Objective*	*Mechanisms/Design/Targeting+*
United States	Section 45X Advanced Manufacturing Tax Credit	Tax credit	Renewable energies	Funding for the manufacture of components for renewable energy generation (photovoltaic equipment, batteries, etc.).	Tax credit amount varies depending on the component to be manufactured.
United States	Section 48C Advanced Energy Project Investment Tax Credit	Tax credit	Several	Funding of projects for the manufacture of equipment for renewable energy, carbon capture, energy efficiency, etc.	Tax credit of up to 30% of investments in the production of clean technologies. Competitive process based on employment effects, environmental impact, costs, speed of implementation and innovation potential.
United States	Advanced Technology Vehicles Manufacturing Loan Programme	Loans	New technologies	Funding of projects for the manufacture of vehicles (and components) with lower fossil fuel consumption.	▪ Loans at preferential rates for vehicle and component manufacturers.
United States	Energy Infrastructure Reinvestment (EIR)	Loans	Equipment replacement	Replacement of energy infrastructure to reduce GHG emissions and other air pollution.	▪ Loans to projects that retool, repower, repurpose or replace energy infrastructure and avoid or reduce the emission of pollutants.
United States	Offshore Wind Energy	Loans and guarantees	Renewable energies	Production capacity of up to 30GW of offshore wind energy by 2030 and 110GW by 2050.	▪ Loan guarantee for a total of up to USD 3 billion (Innovative Energy Loan Guarantee Programme). ▪ USD 8 million investment for R&D projects in offshore wind energy. ▪ USD 48 million in funding for the creation of the National Offshore Wind Research and Development Consortium.

Country	*Title*	*Policy*	*Transition*	*General Objective*	*Mechanisms/Design/Targeting+*
Vietnam	Circular No. 121/2008, guiding incentive mechanisms and financial supports for investment in solid waste management	Tax exemptions, grants, loans, etc.	Waste management	Support for projects on the construction of solid waste disposal, collection and transport facilities.	▪ Land use and land rent tax exemption. ▪ Import duty exemption for capital equipment and supplies (5 years in the latter case). ▪ Income tax exemption. ▪ Grants of up to 30% of R&D expenses for the creation of new recycling, reuse and waste disposal technologies. ▪ Access to preferential credit lines from the Bank of Vietnam

Source: Devised by the authors based on the International Energy Agency (https://www.iea.org/policies), consultations with experts and internet searches.

APPENDIX 3: BEST PRACTICES FOR THE DESIGN AND IMPLEMENTATION OF INVESTMENT INCENTIVES[29]

A. **Each incentive programme must be understood as a component of an incentive system which is in turn part of a sustainable productive development policy**. This will help identify needs and opportunities to exploit complementarities, sequence incentives, avoid contradictions and eliminate gaps, which will contribute to a comprehensive approach to the problem.

B. **Each incentive requires the public disclosure of its rationale,** which must be in line with the strategic priorities of the investment promotion policy, based on the sustainable productive development strategy.

C. **Incentives should ideally be regulated by law** and establish their main characteristics: objectives; types and ranges of benefits (including maximum terms); general eligibility criteria; terms and conditions for extensions; and compulsory transparency, assessment and review.

D. **The mechanism for granting an incentive – conditions for access and eligibility– must be predictable and based on a clear and predetermined set of criteria**, and the incentive must be granted to all projects that meet the announced criteria (except in the case of competitive procedures).

E. **An incentive scheme should be stable but not restrict the right and the need to introduce new regulations.** In the case of complex problems or changes in the environment and its interactions which alter policy priorities and objectives, the instruments must adapt their design based on the experience of implementation. Arbitrariness is to be avoided, so modifications must be well-founded, timely, discussed with stakeholders, and transparent in their political and economic implications.

F. **The public and private sectors must have the necessary resources and capabilities for the proper operation of the incentive programme**. If there is no consistency between the sophistication of the incentive and the capabilities of administrators and beneficiaries, even well-designed mechanisms will fail in their implementation.

G. The design and implementation of incentives should incorporate the business facilitation dimension.

H. **The objectives of the incentive must be explicit and clearly defined at its inception**. This does not mean that the objectives may not be transitory or be adjusted during the policy learning process. The objectives must be specific, verifiable, feasible/realistic and germane (related to effects attributable to the programme) and have a time horizon (possibility of intermediate objectives). Cost and benefit estimates and assessments of the regimes to define their termination, continuation, or reformulation depend on the proper definition of objectives. Clear ex-ante benchmarks for programme success and failure must be established, as they are the basis for early detection of poor performance and the need for remedial action, and they help avoid the arbitrary reduction of expectations when programmes do not work. The objectives established by the law should have a certain degree of generality which will help set specific short-term goals in the context of the regime's administration and modify priorities among the different objectives.

[29] Devised by the authors based on: Cornick (2013), Crespi et al. (2014), Devlin and Moguillansky (2011), Ons (2016), OECD (2013) and Rodrik (2004 and 2008).

I. **Incentive schemes should be transitory, as should incentives for specific projects granted in their context**, which should be applied to economically, socially and environmentally sustainable projects. Incentive programmes should have an expiry date that will make it necessary to review the motivations and conditions for its continuity and reapproval (termination as a default option).

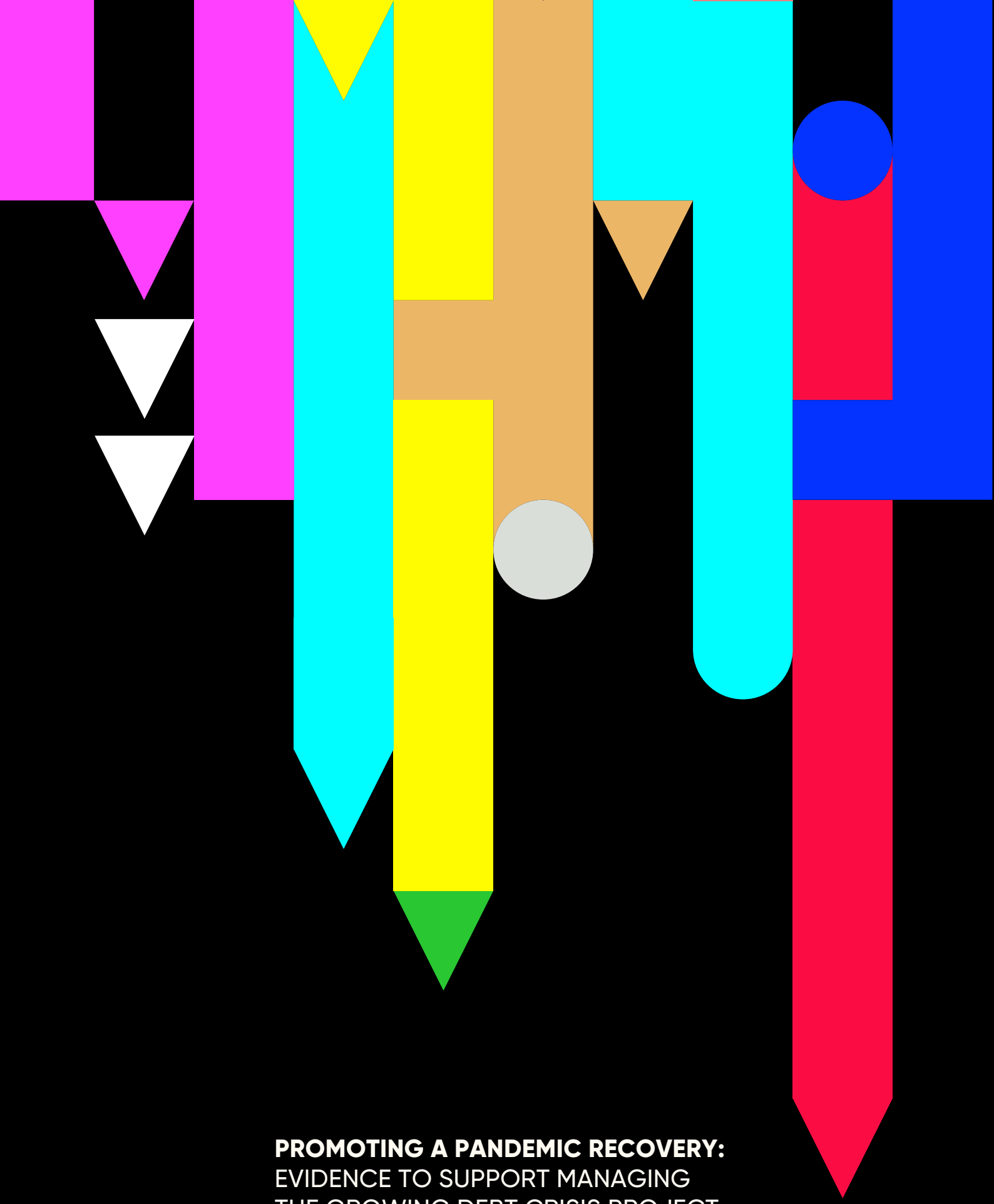
J. **Incentive design should consider establishing requirements and offsets that will promote spillovers and contributions to development goals**. There should be proportionality between the level of the offsets and the intensity and duration of the benefits. The establishment of offsets conditioning the granting of the incentive or its level makes it essential to monitor the investment project.

K. **The costs and benefits of incentives must be assessed prior to their implementation**. This requirement implies specialized technical capabilities, is costly and difficult to fully satisfy due to the variables involved in an assessment. These difficulties do not justify the absence of a cost-benefit analysis, but they do justify the use of simplifying rules as an approach to the problem. The limitations of an ex-ante cost-benefit analysis reinforce the need for periodic assessments and reviews. Cost-benefit analyses should also be made once the incentive has been in operation for some time, and they should seek evidence of expected positive spillovers and negative effects.

L. **Incentives must be monitored continuously and assessed and reviewed periodically**. In addition to making it possible to verify requirements and offsets, monitoring is the process whereby the necessary information is gathered for the periodic assessment and review procedures of the incentive regime. The costs and benefits of the incentive, as well as its effectiveness in terms of the objectives, should be reviewed periodically – and compared with the ex-ante analysis that led to the approval of the programme. The review should also consider whether the objectives are still valid and the instrument is suitable. Special consideration should also be given to the feedback loops between policy design and implementation.

   Review processes feed on programme assessments, which must be systematic and are the basis for deciding whether a scheme should remain the same, be modified or be terminated. The compulsory nature of assessment must be established at the outset, which helps define the information to be collected through monitoring, the methodology/ies to be used and when and by whom the assessments and reviews should be carried out. Particular attention should be paid to the possibility of accessing the information available to different public offices. Impact assessments should be regarded as complementary to other assessment and monitoring methods (it may be the case that the conditions for an impact assessment are in place years after the regime should have come to an end due to its noticeably insufficient outcomes).

M. **The administration of the incentive must be held to the highest standards of transparency.** Such standards are established by the law, are mandatory and carry penalties in case of non-compliance. In contexts of relatively weak institutional support and capacities, the progressive sophistication of investment incentives is only possible under conditions of transparency that will encourage integrity in the actions of public and private actors.



PROMOTING A PANDEMIC RECOVERY:
EVIDENCE TO SUPPORT MANAGING
THE GROWING DEBT CRISIS PROJECT