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Climate Focus

Opportunities for the Implementation of Article 6 of the Paris Agreement in the Solid Waste Sector in Peru



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of Article 6 of the Paris Agreement in
the Solid Waste Sector in Peru

For the Nordic Partnership Initiative
and the Ministry of Environment of
Peru

08 August 2018

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Executive Summary

Peru has pledged in its Nationally Determined Contribution (NDC) to reduce emissions by 20% below business-as-usual (BAU) in 2030 through a combination of public and private domestic funding sources, and 30% below BAU when assisted with international support.

The Nordic Partnership Initiative is supporting the Peruvian Government with the design and implementation of the country's Solid Waste Sector NAMA (SWS NAMA), which is expected to directly contribute to the achievement of Peru's NDC. The Peruvian waste sector is the third largest contributor to national greenhouse gas (GHG) emissions, with solid waste accounting for 77% of the sector's emissions. By building on the SWS NAMA, Peru can tap into new opportunities presented under the emerging international carbon markets, and in particular the cooperative approaches established under Article 6 of the Paris Agreement.

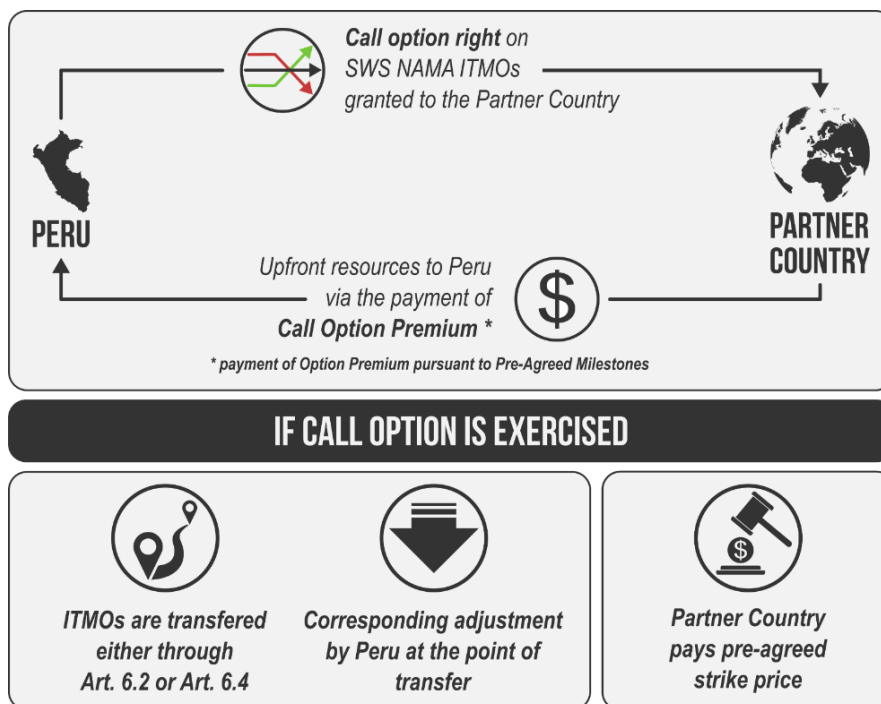
Peru's willingness to engage in an Article 6 transaction is likely to depend on whether the transaction assists the country in achieving its own NDC and incentivizes the private sector to further invest in the country's solid waste sector. This requires careful steering between the risk of transferring emission reductions needed to achieve the Peruvian NDC and finding new revenue streams to improve market readiness and reduce the investment risks associated with solid waste programmes.

This study proposes a conceptual Pilot Cooperative Arrangement that delivers an overall structure for Peru and a partner country to voluntarily engage in the transfer of Internationally Transferred Mitigation Outcomes (ITMOs) from the SWS NAMA. While the proposed approach focuses on having a partner country acting as a possible (co-) funder and buyer of ITMOs, adjustments could be made to tailor the approach to the needs of private sector buyers.

Peru is advancing in its market readiness efforts but it is not yet at the point where it could consider more elaborated and institutionally demanding carbon market approaches, such as a linked cap-and-trade system. The suggested Pilot Cooperative Arrangement, therefore, takes the form of a government-to-government transaction between Peru and a potential partner country, and seeks to complement the on-going market-readiness activities. The proposed arrangement would cover the first two NDC cycles under the Paris Agreement (2021-2025 and 2026-2030).

While acknowledging the possibility of using different transaction models and contractual arrangements, the suggested Pilot Cooperative Approach considers the application of a call option structure in which the partner country has the right, but not the obligation, to purchase available ITMOs from the SWS NAMA at an agreed future date and ITMO strike price. In exchange for the right granted by Peru, the partner country would pay the host country a call option premium in successive tranches in accordance with specific outputs or Pre-Agreed Payment Milestones to be met by Peru.

Pilot Cooperative Arrangement



The suggested call option structure will need to be fine-tuned to accommodate, in a simplified and transparent manner, the emerging international rules of the Paris rulebook and Peru's domestic priorities. At the same time, it will need to remain attractive enough for a partner country to invest in Peru's SWS NAMA. For instance, while the value of the call option premium and the specific Pre-Agreed Payment Milestones would have to be agreed on by the cooperating countries through a Mitigation Outcome Purchase Agreement (MOPA), the payment structure of the option premium will have direct implications on the host country's predictability over future climate finance flows pertaining to that transaction. Also, Pre-Agreed Payment Milestones could be devised in a way that reinforces and complements on-going monitoring, reporting, verification (MRV) work in Peru and assists the country to become consistent with its NDC accounting and reporting obligations under the Paris Agreement.

To mitigate the risk that Peru oversells ITMOs that it may need to demonstrate its own NDC achievement, the exercise of the call option would be conditional upon (i) Peru being on course to over-achieve its NDC or, alternatively, to over-achieve a sectoral target for the waste sector; and (ii) the generation of additional emission reductions from pre-selected activities of the SWS NAMA.

Peru and the partner country could agree to establish a multi-year emissions trajectory for each NDC cycle, which would serve as an indicative non-binding accounting reference for the cooperating countries to measure Peru's overall performance over time. It would thus become an accounting benchmark valid at bilateral/contracting level only. To estimate the generation of ITMOs from the SWS NAMA, the Pilot Cooperative Arrangement would define an SWS crediting baseline that reflects e.g. the NDC unconditional pledge. Using the NDC as a basis for the development of the SWS crediting baseline would furthermore ensure alignment between national and sectoral action.

The actual emission reductions leading to ITMOs would be measured, reported and verified independently. To allow for further flexibility, the MRV

process of the SWS NAMA could be conducted either through the centralized process offered by the Article 6.4 Mechanism or through a rigorous domestic MRV process to be established by Peru on the basis of a possible domestic electronic registry system.

One potential and pragmatic way to allocate and share ITMOs between Peru and the partner Country would be to distinguish emission reductions per technological component of the SWS NAMA. For instance, emission reductions stemming from the implementation of sanitary landfills with methane recovery and flaring could be attributed to Peru, whereas the emission reductions deriving from the use of biogas to produce energy (which come at a higher abatement cost) could be attributed to the partner country.

In terms of corresponding adjustments, while their form, timing, and method are still being debated by the Parties, there could be an advantage in host countries opting to make their accounting adjustment at the point of international transfer. This could ensure more complete information concerning ITMO-transfers and allow a clearer understanding of the 'use rights' attached to them.

The cooperating countries could also agree to a maximum volume of ITMOs for each NDC cycle, where Peru would have no obligation to offer and the partner country would have no obligation to purchase ITMOs in excess of this maximum volume. This would ensure further clarity and make it easier for the host country to manage its emission reduction assets.

The proposed Pilot Cooperative Arrangement for Peru is one possible way of structuring a cooperative approach and provides an initial concept only. Several technical issues and aspects remain that are beyond the scope of this study and need further development and articulation. These include:

- Developing a multi-year emissions trajectory for Peru's first NDC and the SWS Crediting Baseline to estimate the volume of ITMOs that may be available for international transfer
- Discussing with bilateral and multilateral financiers the support and investments intended as climate finance and the expected mitigation result that can be attributed to these
- Clarifying the unconditional and conditional components of the SWS NAMA vis-à-vis the Peruvian NDC, and defining an ITMO sharing arrangement between Peru and the partner country
- Developing a detailed assessment of the type of financing vehicle that would be best suited to leverage funding, including the sources of finance, the structure of finance, the conditions of finance and institutional implementation arrangements
- Negotiating and signing a term sheet that defines key contractual obligations and commercial arrangements for a possible MOPA, including the Peruvian entity that would be legally entitled to act as the seller of ITMOs, the conditions precedent to ITMO transfers, the type and amount of upfront premium payments and the Pre-agreed Payments Milestones, as well as delivery obligations and the unit price to be paid upon the delivery of ITMOs.

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1.

Introduction

Through NEFCO, the Nordic Partnership Initiative (NPI) is supporting the Government of Peru with the design and implementation of the country's Solid Waste Sector Nationally Appropriate Mitigation Action (NAMA). This NAMA is expected to contribute to the (over-)achievement of Peru's Nationally Determined Contribution (NDC) and has estimated investment needs of around US\$47.5 million for the implementation of its portfolio of mitigation activities.¹

This report builds on these NAMA studies and assesses opportunities for the Peruvian solid waste sector under emerging international carbon markets, in particular the cooperative approaches established under Article 6 of the Paris Agreement. Importantly, the assessment of opportunities for improving domestic capacities and tapping into new finance opportunities is based on the following premises already outlined by Peru:

- The use of new international market mechanisms should, first and foremost, assist Peru in (over-)achieving its own NDC target;
- The design and potential implementation of any pilot cooperative approach should be flexible enough to accommodate emerging international guidance while considering national capacities and priorities;
- Robust accounting and quality of emission reductions produced by the Peruvian solid waste sector should be secured via a strong domestic MRV system;
- Private sector participation in Articles 6.2 and 6.4 should be promoted, but conditioned on the authorization and full coordination with a central Peruvian domestic authority;
- Engagement of Peru with new market mechanisms should be geared towards unlocking private investments and accelerate enabling conditions in the Peruvian solid waste sector;
- Existing CDM infrastructure and expertise in the country should be optimized and should consider lessons learned, to the extent that is possible.

This report is structured as follows: Section 2 provides a brief overview of current policies and initiatives in the Peruvian solid waste sector. Section 3 provides a high-level assessment of the country's NDC pledge, the business-as-usual emissions scenarios applied, and existing domestic MRV capacities. Section 4, in turn, offers an analysis of key negotiations in Articles 6.2 and 6.4 of the Paris Agreement and how these are evolving. Section 5 discusses possible arrangements and incentives for Peru, partner countries and investors to engage in market-based cooperative approaches under Article 6. Finally, Section 6 outlines how the aforementioned considerations, opportunities and possible arrangements can translate into a pilot concept that is able to accommodate Peru's main objectives, as well as possible concerns of potential partner countries and international investors.

¹ MINAM (2014). Peru Solid Waste NAMA. [Program for supporting up-scaled mitigation action in Peru's solid waste sector Concept Note](#)

2. Peru's solid waste sector

The Peruvian waste sector is the third largest contributor to national GHG emissions. Solid waste, in particular, was responsible for 77% of the waste sector's emissions in 2012.² Currently circa 47% of total waste sector emissions are generated in the metropolitan area of Lima and the constitutional province of Callao, although this is projected to slightly decrease to around 42.3% by 2030. Peruvian coastal zone municipalities with a population of over 50,000 are the second largest emitters, with total emissions projected to be 12.9% in 2030 (compared to 12.5% in 2010), while the lowest emissions will be generated in municipalities located in forest areas with fewer than 10,000 inhabitants: 2.8% of the total in 2030 (compared to 2.4% in 2010).³

According to the Ministry of Environment of Peru, MINAM, the total amount of municipal solid waste (MSW) generated in 2016 was around 6.8 million tons, of which circa 45% was disposed in sanitary landfills.⁴ Lima and Callao account for the majority of Peru's MSW, totalling 90%, of which more than half is organic matter. Notably, only 2% of inorganic waste is reused and recycled at the municipal level, although the potential for recycling is estimated to be around 1.1 million tons/year or 16% of total MSW.⁵ Table 1 shows the amount of urban solid waste generated between 2008 and 2016.⁶

Table 1 - Urban Solid Waste Generation, 2008 - 2016

Year	Domiciled MSW (t/year)	No-domiciled MSW (t/year)	TOTAL
2008	4 590 138	1 697 722	6 287 860
2009	4 239 293	1 567 958	5 807 251
2010	4 217 274	1 807 403	6 024 677
2011	5 042 228	2 160 955	7 203 183
2012	4 642 000	1 716 904	6 358 904
2013	4 938 090	1 826 417	6 764 507
2014	4 798 388	2 699 094	7 497 482
2015	4 867 044		
2016	6 800 520		

In 2014, about 94% of the urban population benefitted from the solid waste collection system in Peru. However, less than 50% of the waste – only 3.3

² SINIA (2016) National Greenhouse Gas Inventory (INGEI 2012)

³ MINAM (2014) BAU scenario 21010 – 2030 for Municipal Solid Waste

⁴ Waste is comprised of 53% organic matter, 6.5% inert material, 7% sanitary waste, 9% plastics (including plastic bags), 4% paper, 3% wood and foliage, 3.5% cardboard, 3% glass, 2.5% metals, 1.5% fabric and textiles, 1.1% rubber and leather, 0.5% tetra pack and 2.5% others. See MINAM, Gestión Integral de Residuos Sólidos en el País, Presentation to the Congress of the Republic, April 2017.

⁵ MINAM, Gestión Integral de Residuos Sólidos en el País

⁶ MINAM (2015) VI Report on Municipal and no-Municipal Solid Waste Management; Integral Solid Waste Management National Plan 2016-2024 (PLANRES); General Direction for Solid Waste | Solid Waste NAMA; Integral Solid Waste Management in the Country; NIRAS, Perspectives, ECO Consultorías e Ingeniería, Miranda & Amado Abogados and Pontificia Universidad Católica del Perú (PUCP) (2013) Diagnosis of Solid Waste in Peru.

million tons – were disposed in authorized landfills.⁷ A large portion of municipal solid waste is therefore still inadequately disposed in illegal landfills and open dumpsites. Currently, 22 authorized infrastructures for the final disposal of MSW exist in the country, of which five are privately operated while 17 are public. Three of these are located in Lima and one in the province of Callao. They serve more than 85% of the total population living in those municipalities where the sanitary landfills are located.⁸

On the other hand, most of the existing 1,144 dumps have been identified in the departments of Ancash, Puno, Cusco and Cajamarca. MINAM has prioritized 30 of these locations with the goal of converting these into authorized infrastructures for final disposal.⁹ A recent technical analysis commissioned under the NPI to identify the mitigation potential of the informal solid waste disposal sites located in the 22 districts prioritized by MINAM's General Directorate for Solid Waste Management (GDSWM) shows that in the coastal districts a greater amount of GHG emissions could be reduced using decentralized capture and methane combustion, whereas semi-aerobic systems would be the most efficient option in mountain and forest areas.¹⁰

Overall, the design of an efficient waste management policy seems to still be hampered by the lack of data available regarding the type and quantity of waste produced, regarding the existence of available funds and the lack of public education and awareness on the importance of sustainable solid waste management. Moreover, the high level of informality affects municipal revenue collection, undermining the government's capacity to carry out the necessary investments for the adequate collection, treatment and final disposal of waste.

2.1 Relevant policies and initiatives

Waste management in Peru is regulated at different levels of government. Since the outbreak of cholera in Peru in the early 1990s, a range of laws, plans and initiatives related to solid waste management has been enacted.

In 2008, the System of Information for Solid Waste Management (SIGERSOL) was established. The purpose of SIGERSOL is to collect information on solid waste management by local governments, to enable monitoring and reporting on the solid waste system in Peru.¹¹ The System is a crucial tool for assessing the performance and goals set out in the PLANAA and PLANRES (see below) and has the capacity to provide more and better information for the compilation of the national GHG inventory of the country. The first version of the SIGERSOL platform ran from 2008 until 2016, the second version, which is currently in operation runs from 2016 until 2018, and the third version, which is being finalized, will start operating in 2019. Information on solid waste is collected and captured by local governments. For the third version, default values are updated annually using IPCC values and CDM methodologies (when applicable).

⁷ MINAM (2016) [Integral Solid Waste Management National Plan 2016-2024](#)

⁸ PWI and Perspectives (2017). Evaluación de Mecanismos Financieros Públicos, Privados y Público-Privados e instrumentos de política para los operadores de servicios seleccionados en ciudades consideradas en la NAMA en Residuos Sólidos. Not yet published; and Organismo de Evaluación y Fiscalización Ambiental. (2016). Fiscalización Ambiental en Residuos Sólidos de gestión municipal provincial.

⁹ MINAM (2018) Personal interview

¹⁰ Analysis of informal dumpsites and their mitigation potential under the NPI, in collaboration with MINAM. Not yet available on-line

¹¹ ALWA Ingeniería Sostenible (2017) Fortalecimiento del Sistema de Información para la Gestión de Residuos Sólidos (SIGERSOL) Como un mecanismo MRV para la NAMA de residuos sólidos, Diagnóstico del estado actual y los cambios identificados

In 2009, Law n. 29332 and further regulations created the Incentives Program for the Improvement and Modernization of Municipal Management.¹² Within this framework, MINAM and the Ministry of Economy and Finance have been promoting the establishment of an integrated municipal solid waste management system, under which resources are transferred to municipalities conditional upon achievement of specific goals by 2018. To facilitate performance evaluation and resources distribution, municipalities are required to systematically collect relevant information on municipal solid waste planning and management and report to SIGERSOL, using its virtual platform. Specific activities towards the achievement of these goals are source segregation and selective collection of inorganic solid waste, as well as recovery of municipal solid organic waste.¹³

In particular, MINAM has been promoting the implementation of two different initiatives within this Incentives Program: (i) source segregation and selective collection of household solid waste, involving 250 local governments that are considered major cities; and (ii) safe final waste disposal programme of solid waste collected through the municipal public cleaning service, targeting 564 governments considered non-major cities with 500 or more urban dwellings.¹⁴ As a result, 1,477 tonnes per month of reusable solid waste were generated and subsequently incorporated into the formal recycling chain in 2015. Additionally, 365 municipalities completed the identification of suitable areas for the reuse, treatment and final disposal of solid waste.¹⁵

In 2010, the Ministry of Environment launched the “Program for the Development of Solid Waste Management in Priority Zones”. Co-funded by Japan International Cooperation Agency (JICA) and the Inter-American Development Bank (IDB), this program seeks to develop 31 projects to improve solid waste management in 74 municipalities throughout Peru, minimizing waste generation and helping municipalities promote eco-efficiency in priority areas of recycling and safe disposal.

Out of the 31 projects planned, 14 have been deemed viable and are either already implemented or currently under construction (with tender procedures already finalized). The remaining 17 are still under evaluation and others under formulation. These include the construction of sanitary landfills with a semi-aerobic system and the implementation of composting and recycling treatment plants for the reuse of organic and recyclable waste.¹⁶

In 2011, MINAM launched the National Environmental Action Plan (PLANAA PERÚ 2010-2021) with the aim of increasing the segregation of reusable waste in the country. The PLANAA set the goal to have 100% of the solid waste adequately managed by 2021. To achieve this target and incorporate new priorities and interventions, MINAM updated the first National Plan for Management of Solid Waste (*Plan Nacional de Gestión Integral de Residuos Sólidos, PLANRES*), and established a new

¹² Gobierno de Peru (2009) Ley N. 29332

¹³ Gobierno de Peru (2017) Supreme Decree N°. 367-2017-EF

¹⁴ Peruvian municipalities are ranked and classified into four different categories according to their population, deficiencies, needs and potential. The higher the socio-economic potential, the higher the score received. Out of 249 municipalities identified as major cities, 40 municipalities have been selected as “Type A”, combining multiple socio-economic indicators such as population, the Human Development Index (HDI) at the district level, and the property tax bill. The remaining municipalities fall under “Type B”. The municipalities that are considered non-major cities, are classified according to the number of urban dwellings in the municipal district.

¹⁵ MINAM (2016) [Integral Solid Waste Management National Plan 2016-2024](#)

¹⁶ Global Methane Initiative. Solid Waste Management: Peru, accessed on February 1, 2018 https://www.globalmethane.org/documents/events_land_120702_msw_peru.pdf

framework for the period 2016-2024. The updated PLANRES sets a goal of 100% of both reusable and dangerous solid waste recycled or properly treated and disposed by 2024 at the municipal level, respectively.

Furthermore, in December 2017, the regulation to the new Law for Integrated Management of Solid Waste (Supreme Decree n. 014-2017-MINAM) entered into force, introducing significant changes to the 2004 General Law on Solid Waste Management (*Ley General de Residuos Sólidos*). Through this Supreme Decree, Peru is redesigning solid waste management at the national level, establishing a new institutional and regulatory framework, which is expected to serve as a basis to improve sustainability and efficiency within the sector. Overall, the regulation provides more tools to prioritize the recovery and recycling of solid waste over final disposal, in both productive sectors and households.¹⁷

The main modifications introduced by the Supreme Decree can be summarized as follows:

- Establishment of the principle of circular economy, waste recovery, extended product responsibility, shared responsibility and environmental protection;
- Incorporation of the concept of discarded material, with a view to promoting and dynamizing its use within the production processes, as part of the product life cycle;
- Adoption of specific reporting requirements for municipalities, Solid Waste Operating Companies (OE-RS in Spanish) and non-municipal generators, which now have to register information related to generation, composition and final disposal of solid waste through SIGERSOL;
- Promotion of financing instruments for projects, programs and actions towards the adequate management and handling of solid waste, as well as the recovery and reconversion of degraded areas within the Incentive Programme for the Improvement of and Modernization of Municipal Management. While the transfers are conditioned on achieving goals that are checked regularly, these goals are defined according to the needs of each district and its individual potential for improvement.¹⁸ The Incentive Program also provides technical assistance aimed at improving the managerial skills of the personnel working in these districts
- Distinction between different types of municipal solid waste infrastructure projects to reduce discretion in the determination of environmental significance, establishing the appropriate category to speed up the environmental certification process; and
- Granting of inspecting and sanctioning powers to the Environmental Assessment and Monitoring Agency (OEFA), clarifying and further elaborating what constitutes infringement of the law, and increasing fines for inadequate solid waste management.

¹⁷ MINAM (2017) [Decreto Supremo No. 014-2017](#)

¹⁸ The Program's goals for 2018 are: source segregation and selective collection of inorganic solid waste; and recovery of municipal solid organic waste

Despite all the above-mentioned efforts, the solid waste sector remains severely underdeveloped with only 6% of Peruvian municipalities making use of sanitary landfills.^{19 20} Out of the 22 sanitary landfills in Peru, more than half were only implemented in 2015.²¹ The relevant national laws/initiatives are outlined in Table 2 below.

Table 2 - National laws and initiatives in the Peruvian waste sector, 1997 - 2017

Year	Law/Regulation Name	Details
1997	<i>Ley General de Salud</i> (General Health Law)	Recognises the State's responsibility to protect the environmental health of the country. In Article 96 of Chapter IV, it is mentioned that the provision of hazardous substances and products should take all necessary measures and precautions to prevent damage to human health or the environment. In addition, Articles 99, 104 and 107 of Chapter VIII discusses waste and the liability of legal persons, as well as regulating the release of waste or pollutants into the water, air or soil.
2000	<i>Ley General de Residuos Sólidos</i> N° 27314 (Solid Waste Law)	Makes it compulsory to prepare environmental impact assessments for infrastructure projects regarding solid waste, including landfills. It also establishes the responsibility of governments for the management of solid wastes generated. In 2001, while solid waste generation had increased to 4.7 million tons, there were only 4 sanitary landfills in operation, covering about 20% of solid waste generated at the national level.
2002	<i>Ley de Bases de la Descentralización</i> , N° 27783	Establishes that solid waste management is a shared competence of local governments (Provincial, District and Regional Governments).
2004	<i>Reglamento de la Ley de Residuos Sólidos</i> D.S N° 057-2004-PCM (Regulation of the Law on Solid Waste)	Establishes the technical criteria under which solid waste must be managed.
2005	<i>Decreto del Consejo Directivo</i> N° 004-2005-CONAM/CD	The National Plan for Integrated Solid Waste Management (PLANRES 2005-2015) is the first strategic instrument addressing solid waste management at the national level, in response to the requirements of the General Law on Solid Waste and the need to better organize the actions of all sectors and levels of government.
2005	<i>Ley marco del Sistema de Gestión Integral y su Reglamento</i> N° 28245 DS N° 008-2005 PCM,	The National Environmental Management System is designed to guide, integrate, coordinate, monitor, evaluate and ensure the implementation of policies, plans, programs and actions aimed at protecting the environment and to contribute to the conservation and sustainable use of natural resources.
2008	<i>Ley de creación, organización y funciones del Ministerio del Ambiente</i> DS N° 1013	The Ministry of the Environment (MINAM) is established to replace CONAM as coordinating entity for the solid waste management. In addition, a computer system was developed by MINAM for the purpose of electronically collecting information on municipal solid waste, namely the Information System for Solid Waste Management (SIGERSOL).
2009	<i>Ley de Recicladores</i> N° 29419	Provides the regulatory framework for activities of people working independently on the selective collection, separation and marketing of small-scale non-hazardous solid wastes. Additionally, MINAM and the MEF promote the Incentive Plan for the improvement of municipal management, establishing an additional transfer of resources conditional on the fulfilment of goals, such as having a safe final disposal of solid waste.

¹⁹ Proyecto PlanCC Fase 2 (2016) Estudio #5: [Análisis de condiciones habilitantes de las opciones de mitigación priorizadas](#)

²⁰ OEFA (2016) [Organismo de Evaluación y Fiscalización Ambiental](#)

²¹ Proyecto PlanCC Fase 2 (2016) Estudio #5: [Análisis de condiciones habilitantes de las opciones de mitigación priorizadas](#).

2011	<i>Decreto Supremo</i> N° 014- 2011- MINAM	Establishes the Environmental Action National Plan (PLANAA).
2012	<i>Reglamento Nacional para la Gestión y Manejo de los Residuos de Aparatos Eléctricos y Electrónicos</i> DS 001-2012-MINAM	Establishes a set of rights and obligations for the proper management of Waste Electrical and Electronic Equipment (WEEE) through different stages, with a view to involving the different actors in order to prevent, control, mitigate and avoid human health and the environmental damages.
2012	<i>Reglamento de Manejo de los Residuos Sólidos del Sector Agrario</i> DS 016-2012-AG	The objective is to regulate the management and handling of solid waste generated in this sector, in a sanitary and environmentally adequate manner, subject to the principles of prevention and minimization of environmental risks, as well as the protection of human health and well-being, contributing to the sustainable development of the country.
2014	DS N° 013-2014-MINAM	Creates the INFOCARBONO, establishes responsibilities for public entities to report emissions from the activities of their sectors. According to this legal basis, the Ministry of Environment is in charge to manage the system and has to give support and build capacities in the other public entities for annually reporting on their sectoral GHG emissions. Moreover, the Ministry of Environment has the responsibility to collect the information provided by other sectors and to aggregate it for the elaboration of the National GHG Inventory.
2016	<i>Nueva Ley General de Residuos Sólidos</i> N° 27314, D.L. N°1278	Aims at maximising efficiency in the use of materials and ensuring the efficient management of solid waste and establishes the concept of Circular Economy in SWM as it promotes giving a value to waste. The new law simplifies investment procedures in the waste sector, prioritizing public-private partnerships with MINAM, municipalities and generators taking on more responsibilities. Solid waste distributors are immediately converted into Solid Waste Operating Companies, while sludge generated by water treatment plants for human consumption, wastewater treatment plants and other systems linked to the provision of sanitation services are handled as solid, non-hazardous waste.
2017	<i>Reglamento Decreto Supremo</i> N° 014-2017	Sets the framework for the Special Regime for the Management of Solid Wastes from Prioritized Goods, which incorporates producer take-back requirements. It also introduces additional obligations for generators of municipal, special municipal, and non-municipal solid wastes, and establishes recovery responsibilities for generators of used containers of hazardous substances or products.

2.2 CDM projects and the solid waste sector

Peru is the fourth largest participant of the Clean Development Mechanism (CDM) in Latin America. As of February 2018, there are 61 registered projects with an annual GHG emission reduction potential of 10.9 million tCO₂eq. These are mostly renewable energy projects (49), followed by methane capture (6) and energy efficiency (3).²² Table 3 provides an overview of the Peruvian CDM projects portfolio per sector.

²² UNEP (2018) [UNEP DTU CDM/JI Pipeline Analysis and Database](#)

Table 3 - CDM Projects Portfolio

Project type	Annual mitigation potential (tCO ₂ eq)	No of projects	Total CERs issued by Feb 2018
Renewable energy	8 627 000	49	2 900 443
Energy efficiency	1 397 000	3	272 816
Methane capture	490 000	6	1 763 000
Of which landfill gas power	299 000	1	1 439 000
Of which landfill flaring	142 000	3	141 000
Of which waste water treatment (excl. palm oil wastewater)	49 000	1	183 000
Fuel switch	295 637	2	385 489
Afforestation/Reforestation	48 689	1	0
TOTAL	10 858 326	61	5 321 748

Source: UNEP DTU CDM/JI Pipeline Analysis and Database, 2018

Despite the relatively high mitigation potential of CDM projects in the country, only about 5.3 million CERs have been issued by February 2018. This is likely due to the sharp decline in the market of CERs prices, which also prevented new projects from progressing to registration and/or issuance.

Currently, there are six registered CDM projects in the Peruvian waste sector, with overall estimated emissions reduction of 490,000 tCO₂eq per year. Four of these are solid waste management projects. Other than the biogas generated electricity from Lima's largest landfill (Huaycoloro), methane capture is the only type of project registered (Table 4).

Table 4 - CDM Projects in the Landfill Sector

#	Title	Type	Sub-type	Annual Mitigation Potential (tCO ₂ eq)	Credits issued
1	Huaycoloro landfill gas capture and combustion	Landfill gas	Landfill power	299 000	1 439 000
2	Ancon – Eco Methane Landfill Gas Project	Landfill gas	Landfill flaring	69 000	20 512
3	Modelo del Callao Landfill Gas Capture and Flaring System	Landfill gas	Landfill flaring	61 000	120 413
4	Bionersis Project Peru 1	Landfill gas	Landfill flaring	12 000	0

Source: UNEP DTU CDM/JI Pipeline Analysis and Database, 2018

Existing projects in the waste sector face operational expenditures to keep the flares and/or generator in operation. When projects generate power, they can receive revenues from the sale of electricity. Projects with flared landfill gas or biogas from waste water treatment do not have these revenues. For these projects, the remuneration for the reduced emission of greenhouse gasses is often the only source of revenue.

The Huayacoloro project for example generates electricity from landfill biogas, which is sold to the national grid system. Managing to use 50% of the landfill gas captured, while the remainder is flared, the project generates 69% of expected emission reductions. In order to obtain favourable prices for the energy generated, the project also participates in energy auctions.

2.3 The Solid Waste Sector NAMA Proposal

With the support of the NPI, MINAM carried out the NAMA Readiness Programme between August 2013 and June 2015. These readiness efforts resulted in a full-scale NAMA proposal for the national waste sector. This proposal describes in detail the Peruvian Solid Waste Sector NAMA, specifying actions and policies to minimize waste disposal and increase waste recovery. According to NAMA studies already developed, ensuring feasibility of the project activities considered under the Solid Waste Sector NAMA would require an estimated financial contribution of approximately US\$47.5 million.²³

The NAMA Proposal includes three core elements. The first is a proposal of regulatory and policy changes to the 'General Waste Law' in 2016, providing guidelines for municipalities to set quantitative objectives, systematically monitor GHG emissions, simplify investment procedures and develop higher technical standards in the waste sector. The second component focuses on the project implementation of alternative waste management and mitigation actions. This resulted in the selection of the following three technologies:

- Landfill gas capture with electricity generation (LFGE): to be implemented in Lima and cities of at least 400,000 inhabitants, with a mitigation potential of 6.6 million tCO_{2e} between 2015 and 2030
- Landfill gas capture with flaring (Flaring): in cities of between 200,000 - 400,000 inhabitants, with a mitigation potential of 1.5 million tCO_{2e} between 2015 and 2030
- Source separated organic composting (Composting): targeting agricultural areas with less than 200,000 inhabitants, showing a mitigation potential of 273,000 tCO_{2e} between 2015 and 2030.²⁴

The last component of the NAMA Proposal is the establishment of a revolving loan fund (the "NAMA Fund") to effectively channel NAMA finance and implement alternative solid waste management technologies at the municipal level. Based on a competitive selection process, the NAMA Fund would target private and public-sector operators as well as public-private partnerships, as beneficiary entities.²⁵

While the concept of the NAMA Fund and other NAMA-related activities have not yet been implemented, the studies prepared in the context of the NAMA proposal have been used as technical input for the formulation and actualization of the Peruvian NDC and its mitigation targets (see Table 6 in Section 3.2.2).²⁶

²³ MINAM (2014) [Solid Waste NAMA Concept Note](#)

²⁴ MINAM (2014) [Solid Waste NAMA Concept Note](#)

²⁵ NPI (2015) [Waste Sector NAMA Readiness Programme in Peru](#)

²⁶ Technical Secretary of iNDC Multisectoral Commission (2015) Final report. RS n. 129-2015 PC

In addition, since the NAMA proposal, new studies have been conducted, including in particular the '*Proyecto Planificación ante el Cambio Climático*' (PlanCC) led by the Peruvian Government through the establishment of a Multisectoral Committee. Non-binding in nature, the PlanCC seeks to develop possible climate change mitigation scenarios, strengthen domestic capacities, and lay the foundations for long-term low carbon economic growth of the country. The PlanCC is currently on its third phase, which focuses on implementing a range of selected mitigation options for which technical viability has already been assessed.^{27 28}

²⁷ PlanCC (2016) [Objetivos, resultados y legado](#)

²⁸ PlanCC (2016) [Estudio 3: Análisis de instrumentos de política: Propuesta metodológica para la implementación de las NDCs en el Perú](#)

3. The Peruvian NDC and domestic MRV

NDCs can provide a strong basis for the operationalization of new international carbon markets, provided that they ensure clarity and transparency of information used in developing both national and sectoral business-as-usual (BAU) emissions scenarios and in defining (unconditional and conditional) mitigation pledges. The greater the clarity, the more likely it is for a host country to convince the international community that its NDC pledges are both ambitious and below BAU estimates.

Moreover, a sound MRV framework is essential for ensuring the environmental integrity of mitigation outcomes produced at sector and activity level, in particular during a period in which full clarity over the NDC BAU scenario and national pledges is not yet available. The existence of robust domestic institutional and procedural arrangements to measure and track the creation of emission reductions at sectoral level can avoid conflicts with efforts made by the government or other investors to reduce emissions mitigate the risk of transferring hot-air through carbon markets. These measures include, for example, establishing a clear role for carbon markets to support investments, backing these activities and investments with clear MRV procedures, and developing a sectoral emission of mitigation effort reference level that reflects the NDC pledges.

This section explores how the NDC BAU scenario was developed in Peru, and the extent to which previous studies carried out in the context of the Solid Waste Sector NAMA Proposal and its sectoral baseline appear to have been considered in the construction of NDC pledges (Section 3.1). It also provides an overview of the Peruvian institutional and procedural arrangements at different levels and outlines some of the opportunities for the country to position its solid waste sector as an attractive source of quality mitigation outcomes to partner countries and international investors (Section 3.2). Finally, it outlines some high-level opportunities for improvement of market-related readiness efforts in Peru (Section 3.3).

3.1 Considerations on the Peruvian NDC

The first NDC of Peru aims to reduce national GHG emissions by 20% below business-as-usual (BAU) in 2030.²⁹ This ambition is not conditional upon international support and relies on financing from a combination of public and private domestic sources. This commitment could be increased up to 30% below BAU in 2030, through international support and the existence of favourable conditions, such as technology transfer and capacity building.³⁰ Like the NDC BAU scenario, the NDC target covers carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O).

3.1.1 NDC BAU scenario

The Peruvian NDC has been elaborated by a multisectoral commission, an entity composed of 13 ministries and the CEPLAN (Centro Nacional de Planeamiento Estratégico), and was created through the Supreme

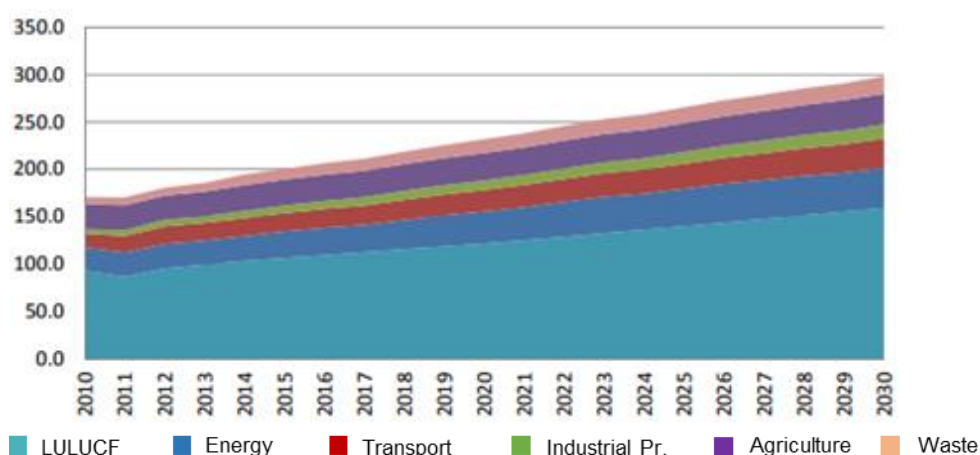
²⁹ Peru submitted its intended NDC in September 2015. With the country's ratification of the Paris Agreement on 25 July 2016, the intended NDC officially became Peru's first NDC.

³⁰ Republic of Peru. 2015. [Intended Nationally Determined Contribution](#) (INDC).

Resolution N° 129- 2015-PCM (“Multisectoral Commission”). The Multisectoral Commission’s final report provides valuable background information on how the NDC BAU scenario and mitigation pledge were developed. Emissions in the BAU scenario are expected to increase from 171 MtCO_{2e} in 2010 to 298 MtCO_{2e} in 2030. Meaning an increase of 74%, and build on the following development assumptions:³¹

- GDP growth of 4.3% per year average from 2015 to 2030;
- Population growth of 14% between 2010 and 2030, reaching 35.9 million by 2030;
- Private investment increase of 3% per year average; and
- Total productivity average growth of 0.8% from 2015 to 2030.

Figure 1 - Emissions in the national BAU scenario for all sectors (MtCo2eq)



Source: Technical Secretary of iNDC Multisectoral Commission. 2015. Final report. RS N° 129-2015 PC

Long-term projections of GDP and population developments are highly uncertain but the assumptions made by the government of Peru should be in line with forecasts by credible institutions. Compared to the latest GDP forecasts available and the World Population Prospects, the development assumptions used by the Peruvian government for the BAU scenario appear realistic. While data from the International Monetary Fund (IMF) projects annual GDP growth to be 3.8% in 2022³², a recent study carried out by McKinsey estimates that the Peruvian economy will grow 4.8% between 2015 and 2030.³³ Both analyses are close to the 4.3% annual growth assumed by Peru’s government in its emissions forecasts for the period 2015 to 2030. For the urban and rural population estimation, both the National Institute of Statistics and Information Technology’s projections and the World Population Prospects’ statistics were used. The 14% population growth expected between 2010 and 2030 in the BAU scenario is in line with these projections.

3.1.2 BAU scenario of the solid waste sector

The solid waste sector was responsible for 5.5 MtCO_{2e} emissions in 2010. In the BAU scenario of the NDC, this value is expected to increase by 82%, to 10 MtCO_{2e} by 2030. This increase is based on the following assumptions:

³¹ MINAM (2016) [Peru’s Third National Communication to the UNFCCC](#)

³² IMF. [Peru Real GDP Growth](#). Accessed on March 19, 2018

³³ McKinsey Global Institute (2017) [Where will Latin America’s growth come from?](#) Discussion Paper

- Waste generation per capita increases by 1.4% from 2010 to 2030, reaching 0.563 kg/day/capita;
- Waste collection coverage increases from 85% to 100% in urban areas from 2012 to 2030;
- The amount of organic waste per capita remains constant but since the expectation is that other waste types will increase, the share of organic waste will decline from 52.6% to 40.6% from 2012 to 2030.³⁴

To estimate the methane production from sanitary landfills, the BAU scenario of the NDC relies on the measurements and assumptions from the CDM project "Sanitary landfill Huaycoloro" which makes use of landfill gas capture and flaring. These assumptions are:

- Methane correction factor (MCF): 0.821;
- Degradable organic carbon (DOC): 0.143;
- Methane recovery factor: the factor itself is not specified but is based on monitoring data from the CDM project "Sanitary landfill Huaycoloro".³⁵

NEFCO commissioned a sectoral BAU scenario analysis in 2014 (the "NAMA BAU study").³⁶ According to this analysis, between 1980 and 2012, emissions from municipal solid waste increased by 2.1% per year. When forecasting waste production up until 2030, the NAMA study uses different assumptions than the Government of Peru used for its NDC. For example, economic growth is forecasted to be 5.1% rather than 4.3%. Additionally, the NAMA study expects the total recycling rate to increase from an estimated 3.5% of solid waste to 6% between 2012 and 2030, and for biological treatment³⁷ to steadily grow by 1% per year.³⁸

Most assumptions for the waste sector are the same, however, and it appears that the NDC as well as the underlying analysis by the PlanCC Multisectoral Commission relied on the NAMA BAU study for the BAU scenario in the waste sector. Still, the NAMA BAU study arrives at lower emission estimates for both 2010 and 2030, with 2.6 MtCO₂ and 3.6 MtCO₂ respectively. The NDC BAU scenario is very sensitive to the pace at which waste collection rates increase, sanitary landfills become operational, and whether they will have landfill gas capture and combustion.

The difference between the estimates made by the NPI studies and those made by the Peruvian Government may stem from the different tier levels applied. The tier level refers to the accuracy of the data sources used. The latest Peruvian national GHG inventory applies a combination of 1996 and 2006 IPCC Guidelines. The NAMA BAU study, on the other hand, applied the 2006 IPCC Guidelines throughout, and uses tier 2 approaches.³⁹ In tier 2 country-specific data on waste production and composition are used and

³⁴ Technical Secretary of iNDC Multisectoral Commission. 2015. Final report. RS N° 129-2015 PC, p. 53.

³⁵ Technical Secretary of iNDC Multisectoral Commission. 2015. Final report. RS N° 129-2015 PC, p. 53.

³⁶ MINAM (2014) [BAU scenario 21010 – 2030 for Municipal Solid Waste](#)

³⁷ Biological treatment comprises both composting and mechanical biological

³⁸ MINAM (2014) [BAU scenario 21010 – 2030 for Municipal Solid Waste](#)

³⁹ NEFCO (2014), Programme Solid Waste NAMA – Peru, "Programme for Supporting Up-scaled Mitigation Action in Peru's Solid Waste Sector", Report: GHG Inventory for Municipal Solid Waste.

a First Order Decay model is used to estimate greenhouse gas, in this case, methane emissions.⁴⁰

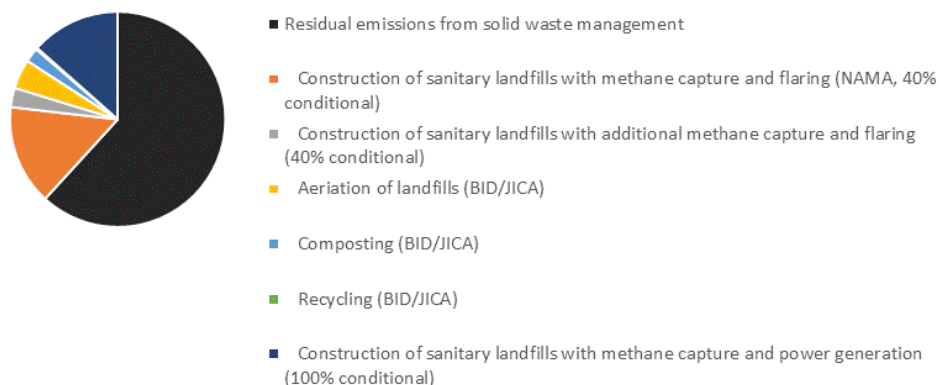
3.1.3 Mitigation ambition

Pursuant to Article 4(3) and 4(9) of the Paris Agreement, all countries are to enter a five-year cycle of communicating NDCs, with each representing a “progression” beyond the previous one. Parties to the Paris Agreement are to show their “highest possible ambition, reflecting its common but differentiated responsibilities and respective capabilities, in the light of different national circumstances”.

Opinions on the ambition of the Peruvian NDC differ. A recent study by the New Climate Institute rates the Peruvian NDC as ambitious, whereas the Climate Action Tracker Initiative (CAT)⁴¹ concludes that Peru’s climate commitment in 2030 is not consistent with emission trajectories that keep global warming to below 2°C, unless other countries make much deeper reductions and comparably greater efforts.

To meet its conditional NDC mitigation ambition of 30%, Peru relies heavily on measures being implemented in the land use, land-use-change and forestry (LULUCF) sector. This sector alone is expected to deliver 67% of all emission reductions.⁴² The contribution of solid waste management to reducing greenhouse gas emissions below the NDC BAU scenario is estimated to be 3.8 MtCO₂e/year by 2030, of which 2.1 MtCO₂e/year is conditional upon international support. With a reduction of 38%, the solid waste sector makes a relatively substantial contribution to achieving the NDC pledge.⁴³

Figure 2 - Mitigation options, their contribution to the 3.8 MtCO₂e/year mitigation ambition and potential role for international partners



The Technical Secretary of the Multisectoral Commission outlines five mitigation options in solid waste management, and one complementary option (table 5).⁴⁴ The Multisectoral Commission also clearly sees a role for international support in the construction of sanitary landfills, equipped with methane capture and flaring of power generation.

⁴⁰ 2006 IPCC Guidelines for National Greenhouse Gas Inventories, [Chapter 3 Solid Waste Disposal](#)

⁴¹ Climate Action Tracker (2017) [Peru NDC Assessment](#)

⁴² Technical Secretary of iNDC Multisectoral Commission. 2015. Final report. RS N° 129-2015 PC, p. 29-30.

⁴³ Technical Secretary of iNDC Multisectoral Commission. 2015. Final report. RS N° 129-2015 PC, p. 29-30.

⁴⁴ Technical Secretary of iNDC Multisectoral Commission. 2015. Final report. RS N° 129-2015 PC, p. 29-30.

Table 5 - Overview of mitigation options in the solid waste sector

Mitigation option	GHG reduction in 2030 compared to BaU (ktCO ₂ e/year)	Accumulative GHG reduction in 2030 compared to BaU (MtCO ₂ e)	Share which is conditional upon international support
Construction of Sanitary Landfills with Centralized Methane Capture and Flaring (NAMA) – 5 projects prioritized	1.51	10.47	40%
Construction of Sanitary Landfills with Decentralized Methane Capture and Flaring – 45 projects prioritized (11 financed by JICA/BID and 34 financed by FONIPREL)	0.29	1.65	40%
Construction of Sanitary Landfills with Semi-Aerobic System (IDB/JICA) – 20 projects prioritized starting implementation in 2020	0.442	2.82	0%
Segregation of organic waste and composting (IDB/JICA)	0.22	1.66	0%
Segregation of inorganic matter and recycling (IDB/JICA)	0.021	0.19	0%
Complementary measure	GHG reduction in 2030 compared to BaU (ktCO ₂ e/year)	Accumulative GHG reduction in 2030 compared to BaU (MtCO ₂ e)	Share which is conditional upon international support
Construction of Sanitary Landfills with Methane Capture and Flaring, and Electricity Generation	1.35	8.75	100%
TOTALS	3.85	25.5	

As part of the Solid Waste Sector NAMA proposal, the Centre for Clean Air Policy (CCAP) also estimated the mitigation potential of the Peruvian waste sector as a whole. They concluded that the sector's accumulated emission reduction potential could be 8.3 to 10 MtCO₂e between 2015 and 2030. This is 17% to 20% below BAU levels. The abatement cost would be in the range of US\$3.90/ tCO₂e to US\$4.59/tCO₂e.⁴⁵ By 2016, several solid waste management projects were already being implemented by MINAM with international support, as follows:

- Construction of 31 sanitary landfills, requiring US\$83 million investment over the period 2017-2030. With support from the IDB, 11 of these projects use conventional anaerobic storage of waste with flaring, and the remaining 20 use semi-anaerobic technology with support from JICA-IADB;
- Improvement and expansion, including methane capture and flaring, of the Integral Management of Municipal Solid Waste in Chiclayo, Province of Chiclayo and Lambayeque, with the financial support of the Swiss Cooperation Agency, and the Municipality of Maynas, financed by Perú
- Coverage expansion within the framework of the Solid Waste Program: Integrated Solid Waste Management Program in the provincial municipalities of Arequipa, Coronel Portillo, Tacna, financed by German Development Bank KfW.

⁴⁵ MINAM (2014) [Peru Solid Waste NAMA Concept Note](#): Program for supporting up-scaled mitigation action in Peru's solid waste sector

3.2 Considerations on domestic MRV capacities

Countries are currently negotiating the modalities, procedures and guidelines of a transparency framework that shall build on and eventually supersede the international MRV system currently applicable.⁴⁶ As such, the current MRV system that was established in the Cancun Agreements⁴⁷ will be eventually replaced by MRV modalities and procedures that serve the nature of the Paris Agreement. The transparency framework is expected to end the formal differentiation in MRV requirements and establish common core obligations for all Parties to the Paris Agreement.⁴⁸

Although it remains unclear whether Article 6.2 cooperative approaches will be reviewed internationally through the enhanced transparency framework (or via some dedicated arrangement under Article 6.2), it seems clear that robust domestic accounting and MRV systems will be needed at multiple levels for countries willing to participate in cooperative approaches.⁴⁹ Countries will thus need to appropriately track their progress in implementing and achieving NDCs, be able to apply corresponding adjustments where mitigation outcomes are internationally transferred and timely and adequately report the necessary information under the enhanced transparency framework.

3.2.1 MRV governance at national level

Peru's national MRV framework is still in development, but national institutional and procedural arrangements are evolving and being strengthened gradually. Peru has submitted three National Communications (2001, 2010 and 2016) and its first Biennial Update Report (BUR) in December 2014.⁵⁰ The country underwent the International Consultation and Analysis (ICA) process, passing through both a technical expert evaluation and a facilitative sharing of views under the Subsidiary Body for Implementation (SBI) in 2015-2016.⁵¹ This has helped improve Peru's national domestic arrangements.

It was noted by the UNFCCC Team of Technical Experts (TTE) in its report published in 2016 that Peru had in place a description of institutional arrangements to prepare its BURs on a continuous basis, including an overarching policy framework and the entity responsible for compiling and validating data for the BUR.⁵² During the TTE assessment the institutional arrangements were only partially implemented, however, and the TTE took note of Peru's plans to systemize its GHG inventory process.⁵³ Since then, Peru has continued to make progress in developing a robust national MRV system.

Currently, the General Directorate for Climate Change, Desertification and Water Resources (GDCCD) is developing a proposal for a national MRV

⁴⁶ UNFCCC COP [Decision 1/CP.21](#) para 98

⁴⁷ UNFCCC COP [Decision 1/CP.16](#) paras 40-47 and 60-64

⁴⁸ At the same time, the mechanism has built-in flexibility with regard to reporting requirements, that takes into account Parties' different capacities. See Paris Agreement, Article 13(1) and 13(2), and Decision 1/CP.21 para 90

⁴⁹ Note that, for the Article 6.4 mechanism, MRV is less of a concern to the extent that the mechanism will offer a centralized international assessment cycle to ensure emissions reductions are additional, real, measurable, and long-term.

⁵⁰ MINAM (2014) [Primer Informe Bienal de Actualización del Perú a la Convención Marco de las Naciones Unidas sobre el Cambio Climático](#)

⁵¹ UNFCCC (2016) [Summary report on the technical analysis of the first biennial update report of Peru submitted on 20 December 2014](#)

⁵² UNFCCC (2016) [Summary report on the technical analysis of the first biennial update report of Peru submitted on 20 December 2014](#)

⁵³ UNFCCC (2016) [Summary report on the technical analysis of the first biennial update report of Peru submitted on 20 December 2014](#)

framework for mitigation.⁵⁴ While this proposal is under discussion, it is already clear that measurement of NDC progress will be informed by: (i) a national digital GHG inventory, known as “Infocarbono”,⁵⁵ and (ii) a National Registry of Mitigation Activities (NRMA).⁵⁶

The Infocarbono, the National Inventory of Greenhouse Gases, was set-up by a governmental decree in 2014,⁵⁷ and allows for the measurement of progress in Peru’s NDC compliance. The same decree establishes responsibilities for public entities to report on emissions from different sectors. The Inventory is hosted by MINAM and includes guidelines for different sectors on how to prepare for national GHG inventories.⁵⁸ The second component under the MRV framework is the NRMA registry, which creates an overview of all mitigation activities in Peru, and thereby provides aggregate data on total emission reductions in the country. The NRMA is created and implemented as part of the Partnership for Market Readiness (PMR) project in Peru.⁵⁹ The system is designed to allow Peru to register emission reductions for results-based climate finance programs, and to make corresponding adjustments for internationally transferred emission reductions.⁶⁰

Moreover, in developing the latest national inventory, Peru has implemented quality control procedures based on the 2006 IPCC guidelines. The GDCCD carried out the quality control.⁶¹ A quality assurance and control (“QA/QC”) plan is an integral part of a sound MRV system, as it strengthens the quality of the data used for the calculation of emission reductions achieved.^{62 63 64}

3.2.2 MRV governance at sectoral level

Having an MRV structure at the sectoral level can ensure the comprehensive accounting of emission reductions, as it uses a governance structure that guides data collection, data management and MRV coordination. The Solid Waste Sector NAMA Proposal⁶⁵ provides a solid conceptual basis to develop a sectoral MRV governance structure in the Peruvian solid waste sector. The table below summarizes the main recommendations in the NAMA proposal on governance arrangements:

⁵⁴ PMR (2017) [Peru: PMR Project Implementation Status Report](#)

⁵⁵ For more information, see <http://infocarbono.minam.gob.pe/>

⁵⁶ PMR (2017) [Peru: PMR Project Implementation Status Report](#)

⁵⁷ [Decreto Supremo No. 013-2014-MINAM](#): Aprueban disposiciones para la elaboración del Inventario Nacional de Gases de Efecto Invernadero (INFOCARBONO)

⁵⁸ PMR (2017) [Peru: PMR Project Implementation Status Report](#)

⁵⁹ The Partnership for Market Readiness is coordinated by the World Bank, which also acts as a trustee and delivery partner for its projects. For more information on the PMR in Peru, see <https://www.thepmr.org/country/peru>

⁶⁰ PMR (2017) [Peru: PMR Project Implementation Status Report](#)

⁶¹ MINAM (2016) [Tercera Comunicación Nacional del Perú a la Convención Marco de las Naciones Unidas del Cambio Climático](#)

⁶² IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, [Chapter 8: QA/QC](#)

⁶³ Niras, TUV Rheinland, GreenStream and Camco (2017) [QA/QC Plan for Waste Sector Egypt](#), Description of Procedures, Capacity building on monitoring, reporting and verification of the GHG emissions and actions in developing countries

⁶⁴ CDM EB (2012) EB 66 Report Annex 49, [Guidelines for Quality Assurance and Quality Control of Data used in the Establishment of Standardized Baselines](#) (version 01.0)

⁶⁵ The NAMA development Pilot Programme in Peru started in August 2013 and was implemented in cooperation with the Ministry of Environment of Peru (MINAM). The Programme aimed to strengthen Peru’s abilities to prepare, propose and implement a full-scale NAMA in the municipal waste sector. Part of the Programme was the development of an MRV system for the NAMA

Table 6 - Solid Waste Sector NAMA proposal

Task	Description
Central coordination office	A central coordination office oversees the overall implementation and operation of the solid waste sector MRV system, as well as: <ul style="list-style-type: none"> • Organization of the monitoring of the required data • Interaction with potential verifiers • Reporting on overall performance to MINAM • Providing technical support on installation, maintenance and MRV to waste generators and plant operators
Monitoring database	The central coordination office is responsible for operating the centralized monitoring database, which should be easily accessible by government offices. Monitoring records and data can be fed into SIGERSOL, the Peruvian Waste Sector Information System. SIGERSOL can then be used to report consolidated data to the central coordinator.
Data collection	Annual data collection and biennial reporting is recommended. The frequency of this can be modified after initial implementation or adapted to donor or internal reporting frequency requirements. Standardized monitoring and reporting templates are developed to ensure that the collected data is comparable and that calculations are transparent.
QA/QC procedures	CDM procedures ⁶⁶ are followed by the central coordinator to check data and information inputs. Additional data quality control checks might be required by donors.
Verification	Verification covers both GHG emission reductions and sustainable development benefits.

In addition, the NRMA is envisaged as a broad registry for not only project-level activities but also for scaled-up mitigation interventions. There are also on-going discussions on how the solid waste sector interventions can be included under the umbrella of the NRMA, and how the Peruvian experience in developing the REDD+ (Reducing Emissions from Deforestation and Forest Degradation) registry can serve setting up the NRMA.⁶⁷

The continued refinement and strengthening of the SIGERSOL is another important development in Peru. The SIGERSOL is currently in phase 2, where phase 3 is to start in 2019. In relation to its initial version, SIGERSOL has improved the process for entering data, increased categories and fields for adding data, and allowed for a time series aggregation of information. It does not yet, however, allow for consolidation of data into larger scales (e.g. provincial level) and still requires better monitoring of the quality of data recorded into the system, for example a large portion of waste collection services (circa 60%) is outsourced to private entities that are not mandated to provide information to municipalities responsible to enter data to SIGERSOL, hence there is an important gap in the amount and quality of data that needs to be addressed. Version 3 is expected to address those issues, as well as to improve the interface for users and inter-operability with other database systems in Peru.⁶⁸

⁶⁶ CDM EB (2012) EB 66 Report Annex 49, [Guidelines for Quality Assurance and Quality Control of Data used in the Establishment of Standardized Baselines](#) (version 01.0)

⁶⁷ PMR (2017) [Peru: PMR Project Implementation Status Report](#)

⁶⁸ First and second deliverables of: ALWA Ingeniería Sostenible (2017). Fortalecimiento del Sistema de Información para la Gestión de Residuos Sólidos (SIGERSOL) Como un mecanismo MRV para la NAMA de residuos sólidos - Diagnóstico del estado actual y los cambios identificados. NEFCO – Not yet available online.

Furthermore, Peru has experience with the approval and authorization of private and public entities under the CDM. The Directorate also assumes the function of Designated National Authority (“DNA”), whereby the DNA has approved 61 CDM projects, including 6 projects in the solid waste sector. The Directorate acts as the Technical Secretary under the PMR, facilitating the participation of the various sectors involved in the implementation of the NDC.⁶⁹

Since the NAMA Proposal, Peru has kick-started a number of activities to strengthen the solid waste sector. To centralize data collection and management, SIGERSOL was established as the repository of information on municipal waste management, including the operation of landfills.⁷⁰

In December 2017, the regulation to the new Law for Integrated Management of Solid Waste⁷¹ entered into force, redesigning solid waste management at the national level that was based on the General Law on Solid Waste Management from 2004. The new regulation provides additional tools that prioritize solid waste recovery and recycling over disposal. Importantly, the regulation sets specific reporting requirements for municipalities and non-municipal generators that are now required to register information on the generation, composition and final disposal of waste through SIGERSOL. Examples of reporting documentation include the quarterly Operator’s Report on solid waste management, the Annual Statement on Minimization and Management of Non-Municipal Solid Waste, and the solid Hazardous Waste Manifesto.⁷²

However, the fragmentation of solid waste sector management and the poor response from local governments to request information for SIGERSOL poses the risk of decreasing the quality of data in the database. Peru is aware of this and is continuously making progress to improve coordination in the sector. MINAM, through the GDSWM is responsible for coordinating, promoting, and advising sectoral authorities and regional and local governments on the implementation of regulations for solid waste management.⁷³

In addition to the increasing amount of data that is being requested from municipalities, SIGERSOL now collects data on the basis of the IPCC guidelines,⁷⁴ providing for a more solid calculation of GHG emissions at the sectoral level. Finally, SIGERSOL now collects data on an annual basis, and municipalities are required to assign a person responsible to facilitate the reporting of information to the database⁷⁵, which should increase the level of response from local authorities.

3.2.3 MRV at the activity level

The MRV approach in place to measure emission reductions at the activity level is the MRV layer closest to the emission reduction generating activities. When disposing waste in a landfill, the methane production is estimated with a First Order Decay model. This model uses current and

⁶⁹ PMR (2017) [Peru: PMR Project Implementation Status Report](#)

⁷⁰ PMR (2017) [Peru: PMR Project Implementation Status Report](#)

⁷¹ Law for Integrated Management of Solid Waste, Supreme Decree No. 014-2017-MINAM

⁷² Regulation to the new Law for Integrated Management of Solid Waste (Supreme Decree n. 014-2017-MINAM)

⁷³ PMR (2017) [Peru: PMR Project Implementation Status Report](#)

⁷⁴ ALWA (2017) Fortalecimiento del Sistema de Información para la Gestión de Residuos Sólidos (SIGERSOL): Datos requeridos en las GL1996 para INGEI, en mercados de carbono y en GL2006

⁷⁵ [Decreto Legislativo Que Aprueba La Ley De Gestión Integral De Residuos Sólido \(No 1278\)](#), Artículo 68

historic data on the accumulation of organic waste in the landfill to estimate current and future methane emissions. This model is used in IPCC guidelines for national inventories and in CDM methodologies to estimate future methane production in a landfill.

When *avoiding methane* by applying biological treatment methods, like composting, methane production is reduced but not absent. There the IPCC proposes default factors. The level of accuracy, the tier level, improves when default factors are replaced by national statistics or measurements on the different treatment methods (tier 2), or even facility or site-specific data (tier 3). In practice this means that the monitoring efforts for the national inventories get closer to project-specific monitoring when moving to higher tiers.⁷⁶

When capturing and combusting methane from a sanitary landfill, estimating the amount of methane combusted is a crucial factor to determine the avoided greenhouse gas emissions. The national default factors are insufficient and on-site measurement is recommended. The advantage of on-site measurement is that information on the amount of methane combusted is a relatively accurate basis to estimate the emission reductions from the project. The site-specific data from these mitigation activities can be cross-checked with the modelling outcome on which inventories of emissions from solid waste is based. The amount of methane captured should not exceed the amount which was expected based on the First Order Decay Model.

3.3 Opportunities for improvement

To tap into existing and new market opportunities, it will be essential that the Peruvian NDC BAU scenario, as well as the sectoral and/or activity baselines, are perceived as being conservative and realistic (enticing real action on mitigation). Rigorous crediting baselines that take into consideration the NDC (conditional and unconditional) pledges and are independently verified can help Peru access additional markets and buyers.

There are a range of opportunities for Peru to improve its NDC and make it more amenable to attract climate finance and take advantage of approaches under Articles 6.2 and/or 6.4 of the Paris Agreement. Most of these refer essentially to improving clarity and understanding of how the Peruvian NDC was developed, as well as how the national targets can be allocated to different sectors.

In this respect, clearer and more structured information could be provided to, for instance: (i) clarify why the NAMA BAU differs from the NDC BAU in the technical analysis prepared by the Multisectoral Commission; (ii) identify (at project level) which mitigation activities Peru is planning to carry out without international support, and where international support is required;⁷⁷ and (iii) define how sectoral or project mitigation outcomes are to be measured. The crediting baseline, against which mitigation outcomes are defined, should be realistic and, ideally, derived from Peru's NDC targets.

Similarly, with respect to domestic MRV capacities, opportunities exist for Peru to promote conditions which can facilitate the use of carbon markets. Measuring and tracking progress in the achievement of mitigation goals at

⁷⁶ 2006 IPCC Guidelines for National Greenhouse Gas Inventories, [Chapter 3 Solid Waste Disposal](#) and Chapter 4: [Biological Treatment of Solid Waste](#)

⁷⁷ The current list of activities, as shown in table 5, can be the starting point of discussion, as well as the current portfolio of CDM projects.

national level will invariably include an assessment of NAMAs and scaled-up crediting mechanisms eventually implemented domestically, as well as the use of ITMOs through cooperative approaches.

Although the Peruvian solid waste sector has made some considerable progress in setting-up a sectoral MRV system since the development of the Waste Sector NAMA Concept, certain MRV components are likely to require further development to better equip the country to track and measure national and sectoral performance. These are briefly summarized below:

- Whereas the responsibility for coordination between sectoral authorities, regional and local governments to implement regulations on solid waste management, including the obligation of plant operation managers to monitor their activities, is centralized in the GDSWM,⁷⁸ there is room for improvement regarding in-sector coordination. As such, further specifying, detailing and enforcing monitoring requirements in the solid waste sector can strengthen monitoring activities. Preparing monitoring and reporting templates could ensure consistency and input of qualitative data into SIGERSOL, which is essential for robust emission reduction calculations.
- Continuing to strengthen SIGERSOL as the waste management data registry constitutes an opportunity for Peru to further centralize data collection at the sectoral level. Recognizing this opportunity, through GDSWM, MINAM is improving SIGERSOL. By further extending reporting obligations to private sector collection services and strengthening the technical and staff capacity operating the system, this registry could be able to take over data handling from the central MRV coordinator, as was envisaged in the Solid Waste Sector NAMA Proposal, and function as a specialized waste-sector registry which further improves the quality and quantity of data collection and handling.
- By preparing procedures for the systematic identification, formulation and analysis of risks of not meeting quality objectives, as well as by defining and implementing activities to mitigate that risk,⁷⁹ the DNA has an opportunity to further strengthen and streamline the QA/QC procedures.
- Given the timing, there is an opportunity for Peru to develop its national and waste sector MRV systems in parallel, and so to ensure alignment between the two systems and transparency in emission reduction accounting. Once both systems are fully developed, MRV procedures can be formalized.
- Capacity building is central to enabling effective implementation of MRV in the solid waste sector. To ensure continued and qualitative capacity-building throughout the solid-waste sector, it is suggested to formalize capacity building activities, and make its implementation part of the responsibilities of the central coordinating office.
- Stakeholder engagement provides an opportunity to improve the quality of mitigation projects and ensure the sustainability of their

⁷⁸ See MINAM [Funciones La Dirección General de Gestión de Residuos Sólidos](#)

⁷⁹ CDM EB (2012) EB 66 Report Annex 49, [Guidelines for Quality Assurance and Quality Control of Data used in the Establishment of Standardized Baselines](#) (version 01.0)

implementation through embedding projects in society. As such, stakeholder participation at project level contributes positively to ensuring long-term and permanent mitigation in the solid waste sector. At the national level, MINAM has, in the past years, organized a number of thematic dialogues on climate change to engage civil society and non-governmental stakeholders; as well as a number of workshops to assess the role of carbon markets.⁸⁰ To further strengthen the MRV system at the sectoral and project level, Peru could expand stakeholder engagement activities to both levels. Requiring project implementers to engage stakeholders during the project design phase, or to include stakeholder consultations in project monitoring requirements are options to increase the MRV robustness in the solid waste sector.

Overall, Peru has ambitious plans to improve solid waste collection and management. The commissioning of sanitary landfills to avoid open dumpsites will increase the amount of waste which is disposed under anaerobic conditions. However, this can lead to an increase methane production. Even when the identified mitigation opportunities are employed fully, and sanitary landfills are equipped with methane capture and destruction, GHG emission from the waste sector may still increase according to estimates by the Government of Peru.

Emissions from solid waste are expected to increase 4.5 MtCO₂e over 2010 to 2030, whereas the identified mitigation measures will only reduce emissions with 3.8 MtCO₂e. This makes it important that methane emissions are avoided as much as possible, perhaps even beyond the measures identified already. Partner countries with solid expertise with waste avoidance and optimizing the value of organic waste could play a significant role in increasing local waste management capacity.

⁸⁰ PMR (2017) [Peru: PMR Project Implementation Status Report](#)

4.

Article 6.2 and 6.4 developments

This section provides an analysis of both cooperative approaches under Article 6.2 and the centralized mechanism established by Article 6.4 (herein referred to as Article 6.4 Mechanism) to inform Peru during the upcoming climate negotiations as well as to highlight how different international market-routes could be used by Peru going forward.

It considers the evolution of negotiations on Articles 6.2 and 6.4. and outlines the key elements and points of convergences and divergences for both. In doing so, the positions of Peru and other key Parties are presented. It then describes what a CDM transition could mean and look like, as well as its pros and cons. Finally, it presents a literature review of potential market demand for mitigation outcomes and emission reductions post-2020.

4.1 Stocktaking of Article 6.2 and 6.4 negotiations

The mandate of the Paris Agreement and the COP21 Decision is for Parties to (a) agree on the guidance for cooperative approaches (Article 6.2); and (b) develop the rules, modalities and procedures of the new mechanism (Article 6.4). Negotiations are taking place under the Subsidiary Body for Scientific and Technological Advice (SBSTA).

Cooperative approaches under Article 6.2 provide a decentralized approach for countries to help achieve their NDCs. It enables Parties to transfer and use Internationally Transferred Mitigation Outcomes (ITMOs), following international guidance currently being developed by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA). The Article 6.4 Mechanism, on the other hand, offers Parties a centralized crediting instrument that may be used by all to help achieve their NDCs and support their sustainable development.⁸¹

While several issues are currently being discussed for both international routes, aspects relating to, environmental integrity, accounting of ITMOs, ambition and corresponding adjustments are particularly important for Article 6.2 and Article 6.4, depending on whether units under the Article 6.4 Mechanism are also deemed ITMOs. In addition, Parties are currently negotiating, in the context of Article 6.4, the treatment of additionality and baselines, the application of the concept of overall mitigation of global emissions (OMGE),⁸² and a possible CDM transition.

At COP23, international negotiations advanced in a balanced and coherent manner under SBSTA and Parties agreed to the endorsement of informal notes per each agenda item under Article 6.⁸³ Although various aspects of these informal notes are expected to change as negotiations move forward, they capture the main concerns of each Party at the moment.

⁸¹ Howard, A., Chagas, T., Hoogzaad, J., & Hoch, S. (2017). [Features and Implications of NDCs for Carbon Markets](#), in: Swedish Energy Agency (2017). Reports on international cooperation for climate change mitigation.

⁸² The concept of OMGE is further discussed in Section 6.5 below

⁸³ Available [here](#) (agenda item 11a-11c)

Below we outline the convergences and divergences within the Article 6.2 and Article 6.4 negotiations as well as the views of key Parties on opposite spectrums with respect to the aforementioned aspects.

Article 6.2 negotiations

Parties have different views on the key issues currently discussed under Article 6.2. There are several points of convergence and divergence relating to ambition, environmental integrity, accounting of ITMOs and corresponding adjustments. The overarching question being discussed is to what extent international oversight or governance should be rigorous or flexible, or more specifically, how much oversight from the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA) is needed and how much can be left for national governments to take on themselves.⁸⁴ Moreover, the question remains if Article 6.2 guidance should be provided for accounting of ITMOs only, or if other aspects should be covered as well, such as environmental integrity, sustainable development and transparency in governance.⁸⁵

Figure 3 below provides a summary of country positions on international oversight and Article 6.2 guidance. While some Parties such as Brazil and the Environmental Integrity Group (EIG) seem to prefer strong international oversight regarding accounting and ITMOs, others such as the Independent Association of Latin America and the Caribbean (AILAC) countries (including here Peru), and Like Minded Developing Countries (LMDCs) appear to favour minimal oversight instead and wish to ideally limit Article 6.2 governance for accounting and ITMOs.

One important aspect that has yet to be agreed on is what constitutes ITMOs. ITMOs remain undefined under the Paris Agreement, leading to Parties interpreting the nature of ITMOs in different ways. While some Parties see ITMOs as units generated under carbon standards that ensure that ITMOs represent real, measurable, additional, verified and long-term emission reductions, other Parties differentiate units issued under carbon standards and ITMOs. Another view is also the notion advocated by Brazil, whereby ITMOs are likened to allowances (Assigned Amount Units - AAUs) under the Kyoto Protocol and issuance of these by a country, depend on a quantification of the permitted emissions under its NDC.⁸⁶ ITMOs are in this case subtracted from a country's overall budget, if exported. The most plausible point of convergence for Parties might be agreeing on certain characteristics of ITMOs, such as if their denomination should be in tonnes CO₂e. It will be more difficult to agree on a multilateral definition of what an ITMO is, considering that some Parties also do not want to define ITMOs indefinitely. This definition would then be left to the cooperating Parties.⁸⁷

⁸⁴ Analysis made by Michaelowa, A., and Greiner, S. in the context of the Discussion Paper Status of negotiations – key areas of consensus and contention. Perspectives Climate Research. To be published in 2018.

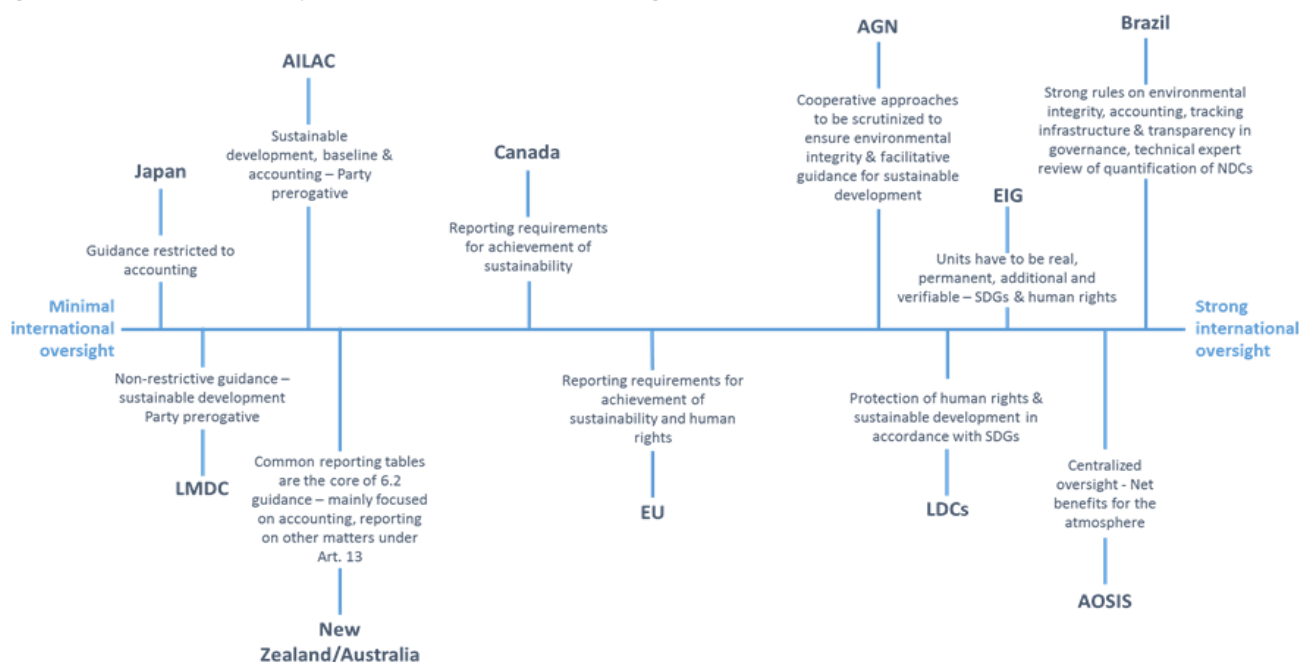
⁸⁵ Analysis made by Michaelowa, A., and Greiner, S. in the context of the Discussion Paper Status of negotiations – key areas of consensus and contention. Perspectives Climate Research. To be published in 2018.

⁸⁶ Analysis made by Michaelowa, A., and Greiner, S. in the context of the Discussion Paper Status of negotiations – key areas of consensus and contention. Perspectives Climate Research. To be published in 2018.

⁸⁷ Michaelowa, A., and Greiner, S. in the context of the Discussion Paper Status of negotiations – key areas of consensus and contention. Perspectives Climate Research. To be published in 2018.

Another key aspect that remains unresolved is that of accounting and corresponding adjustments. Accounting refers to the avoidance of the double counting of ITMOs towards more than one Party's NDC. All Parties agree that there is a need for robust accounting, yet each provides different options regarding its technical implementation. The key points of divergence relate to how these can be ensured considering different NDCs as well as when adjustments should occur.

Figure 3 - Spectrum of Party views on international oversight



Source: Michaelowa, A., Greiner, S. (2018) Status of negotiations – key areas of consensus and contention

Below we provide a summary of how key Parties view ITMOs, accounting and corresponding adjustments, as well as sustainable development:⁸⁸

- Brazil:** Brazil wishes to see a robust multilateral accounting framework whereby cooperative approaches are budget-based and similar to international emissions (AAUs) trading under the Kyoto Protocol. ITMOs are subtracted from the country's overall budget when exported and count towards NDCs. Moreover, for Brazil, Article 6.2 guidance does not hold true for hosting activities under Article 6.4. Therefore, corresponding adjustments would not be required in the first transfer from a host-country to a recipient country. Brazil believes that when Article 6.4 units are transferred from the Article 6.4 registry to a buyer country registry, they would equate to a 'forwarding' of units (as opposed to a 'transfer') and, therefore, not be subject to corresponding adjustments. Brazil then concludes that corresponding adjustments would only apply in the context of Article 6.4 when its units are transferred onwards from a country registry that received these units from the mechanism's registry. As a result, there would not be any need to differentiate between accounting for Article 6.4 activities that occur within and outside the scope of the NDC.

⁸⁸ Analysis made by Greiner, S., Chagas, T., Krämer N. and Diagne, E. H.M. in the context of the Article 6 Options Paper: An information basis for understanding progress on Article 6 in the UNFCCC negotiations. To be published in 2018.

- **EIG:** As the name says, environmental integrity is the guiding principle of the EIG, no matter how member Parties' positions can differ. The other two principles are no double counting and sustainable development. Therefore, the EIG advocates for a strong UN oversight. It seeks to ensure environmental safeguards, alignment of the definition of sustainable development with the Sustainable Development Goals (SDGs) as well as respect of human rights under Article 6.2. EIG stress the fact that ITMOs must be added to the exporting country's reported emissions that could go towards NDCs, for voluntary cancellation⁸⁹ or towards CORSIA. Members of the EIG further advocate the need for a centralized infrastructure as well as international transaction log in order to keep track of ITMOs. ITMOs are in this case seen in the same way as units generated under carbon standards and are issued following a third party technical review. For the EIG, it is important that ITMOs represent real, measurable, additional, verified and permanent emission reductions.
- **AILAC:** AILAC favours a strong role of national governments in defining sustainable development, baselines and accounting approaches. Moreover, accounting under Article 6.2 should be robust and consider a budget approach. Seeking to have ITMOs be counted towards NDC goals, AILAC proposes the use of Designated Operational Entities (DOEs) to ensure that ITMOs are real, measurable and verifiable. ITMOs should be expressed in terms of CO₂e and experiences from the Kyoto era and the CDM could be used as inputs to avoid double counting as well as guarantee environmental integrity.
- **Peru:** Following exchanges and calls with MINAM within the context of the present study, it would appear that Peru has a preference for Article 6.2 guidance to ensure not only robust accounting, but also centralized oversight of emission reductions and environmental integrity. The use of ITMOs could mean developing measures that aid in its implementation such as an MRV system, financial structuring, and technology transfers, among others. For Peru, the use of ITMOs may also translate into setting certain limits to avoid jeopardizing its own NDC achievement. When corresponding adjustments need to occur is yet to be defined. Finally, it is also important for Peru that Parties demonstrate how mitigation measures under cooperative approaches will contribute to the implementation of their NDCs.
- **LMDC:** In establishing an inclusive process the LMDC advocate for a bottom-up approach to the Article and the prerogative of Parties to define their NDCs. Concerning ITMOs and accounting, LMDC members propose a 'buffer approach' whereby NDCs are shielded from ITMO transactions. Those ITMOs sold or bought are then recorded in a separate buffer registry starting at zero. It remains unclear though, how this buffer system could operate and serve to avoid double counting. ITMOs also do not require a multilateral definition and are left for cooperating Parties to define. This means that LMDCs favour a non-restrictive guidance, which also includes sustainable development as a Party prerogative.

⁸⁹ For example: Cancellation of CERs under the CDM, available [here](#).

- **EU:** The European Union plans to meet its quantitative commitments under its NDC through domestic measures alone. In doing so, it is open to consider the use of Article 6.4 depending on how the mechanism is operationalized, particularly in regard to long sought reforms of the CDM. Wanting to ensure that all aspects of Article 6 are well defined (especially for Article 6.4) before taking further steps of implementation, the EU is mainly concerned with a robust accounting system under Article 6, whereby cooperative approaches are subject to a centralized accounting database. It wants to ensure environmental integrity through the avoidance of double counting and a form of reporting for both sustainable development and conformity with human rights under Article 6.4. The EU also advocates for heightened ambition of NDCs and the sharing of mitigation outcomes by Parties.

Article 6.4 negotiations

Several points of divergences on key issues being negotiated under Article 6.4 must also be settled in upcoming sessions. A key question discussed under Article 6.4 is whether units generated under this new market mechanism should also be considered ITMOs and if so, whether Article 6.2 guidance on international transfers and corresponding adjustments should be applicable. While most Parties agree that emissions reductions generated under the Article 6.4 mechanism should be considered ITMOs and require a corresponding adjustment, differing views remain.

In Brazil's view, for example, Article 6.2 guidance would not apply to Article 6.4 initial transfer (akin to a forwarding transaction under the CDM⁹⁰) from the central registry to a national registry. In this case, Article 6.2 guidance would only apply to second and subsequent international transfers.⁹¹ This means that Article 6.4 units would not be considered ITMOs for the first transaction.

Where corresponding adjustments are needed for Article 6.4 units, Parties present several options on when adjustments would have to occur. While some believe that adjustments should be made at the moment an ITMO is created or issued, others would like adjustments to occur at the moment of acquisition by a recipient country. Adjustments could also take place when information is submitted under the transparency framework or when the ITMO is used against the recipient country's NDC. Some Parties also present certain cases where corresponding adjustments are seen as not necessarily needed. This includes in particular emission reductions that are generated outside the host Party's NDC and therefore pose no potential risk of double counting.

⁹⁰ Here, *forwarding* refers to the distribution of CERs from the CDM registry pending account to another account. Once issued, the CDM registry will, at the request of a nominated account representative, 'forward' CERs to a specific account in the CDM registry or to an account in a national registry. A forwarding of CERs is not subject to Kyoto eligibility checks by the ITL. Furthermore, based on precedents from the previous commitment period, CERs can continue to be forwarded without restrictions (even beyond the respective true-up period), provided the relevant national registry does not unilaterally bar the receipt of CERs.

⁹¹ Government of Brazil (2017) [Views Of Brazil On The Process Related To The Rules, Modalities And Procedures For The Mechanism Established By Article 6, Paragraph 4, Of The Paris Agreement](#)

4.2 Prospects for the transition of the CDM

Peru hosts six mitigation projects as part of the CDM in the waste sector with an annual GHG emission reduction potential of 490.000 tCO_{2e}. Given this significant emission reduction potential of the CDM pipeline in Peru, the possibility of a CDM transition into the Paris Agreement provides an opportunity for the country to continue using existing activities and capacities to generate (finance for) emission reductions in the solid waste sector. As part of the ongoing negotiations on the rules and procedures that will govern the implementation of the Paris Agreement, Parties are currently negotiating whether, but more centrally, how the CDM should transition to the Article 6.4 Mechanism.

CDM and the Article 6.4 Mechanism compared

The CDM is one of the flexible mechanisms of the Kyoto Protocol. It was created and adopted as part of the Kyoto Protocol in 1997,⁹² with its operational rules further developed as part of the Marrakech Accords, adopted in 2001.⁹³ The CDM allows emission-reduction projects in developing countries to generate Certified Emission Reduction (CERs) that can be traded and sold internationally. Annex I countries, with legally binding emission reduction targets under the Kyoto Protocol, can buy and use these offset credits to meet their emission reduction targets. At the same time, the revenues from the sale of CERs can be used by developing countries to stimulate (sustainable) development and emission reductions at home.

Whereas the CDM served the bifurcated world in which emission reduction targets were set for developed but not developing countries, the Article 6.4 Mechanism will operate in a setting in which all countries have emission reduction pledges.⁹⁴ As such, the Article 6.4 Mechanism will be different from the CDM and may, in fact, be considered closer to the Joint Implementation (JI) mechanism of the Kyoto Protocol. Table 7 below outlines the main differences between the CDM and the Article 6.4 Mechanism.

Table 7 – Main differences between the CDM and the Article 6.4 Mechanism

ELEMENTS	CDM	ARTICLE 6.4 MECHANISM
Governance and authority	Under the authority of the CMP, supervised by the CDM Executive Board.	A central governing body will be established, Parties are negotiating what this governing body will look like.
Eligibility of participating countries	Distinction between Annex I and non-Annex I countries. Non-Annex I countries only can host CDM projects. Transfer of CERs requires a DNA approval from an Annex I Party.	While eligibility requirements are still being negotiated by Parties, it is highly likely that all Parties to the Paris Agreement can participate in the Article 6.4 Mechanism, and all Parties can be recipient and transferring countries.
Accounting for emission reductions	Not accounted by developing countries. How a transferred unit is used by the acquiring country (used	Different types of emission reduction commitments by Parties through their NDCs. Countries are still

⁹² See [Kyoto Protocol to the United Nations Framework Convention on Climate Change](#) (1997) Article 12

⁹³ COP Decision 15/CP.7 [Principles, nature and scope of the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol](#), Part of the Marrakesh Accords, adopted in 2001

⁹⁴ See [Paris Agreement](#) (2015) Article 6

	for Kyoto compliance, retired, or cancelled) does not affect the emissions inventory of the transferring country. Annex I countries use emission budgets to account for emission reductions.	negotiating whether credits transferred through the Article 6.4 Mechanism require corresponding adjustments. 'No double counting'-requirement implies that a transferred unit may only be used once for accounting purposes.
Types of activities	Projects and programmes of activities. Crediting of policy interventions not possible.	It is currently discussed whether in addition to Projects and Programmes, the Article 6.4 Mechanism will also enable the generation of credits through sectoral or policy-based mitigation interventions.

CDM transition and evolutions of negotiations

How long the CDM will continue to operate under the Kyoto Protocol is unclear. Although the CDM has no particular end-date and its operation is not – in theory – tied to commitment periods, the CDM has lost traction and is plagued with uncertainty about post-2020 continuation of the mechanism and its projects. The Article 6.4 Mechanism, on the other hand, is expected to start operating from 2020 onwards.

A possible CDM transition into the Paris Agreement has different aspects, including: (a) the migration of CDM projects and programmes; (b) the use of the same rules and procedures; and (c) the migration of issued CERs for use in the context of the Paris regime and NDCs. While it is beyond the scope of this paper to assess in detail each of those perspectives, we provide below an overview of possible pros and cons of a transition.

There are a number of reasons for considering the transition of the CDM into transition to the Article 6.4 Mechanism. First, with regard to existing mitigation efforts, CDM transition creates an incentive for Parties to continue their mitigation activities, thereby preventing the loss of existing mitigation efforts. Secondly, transition will create predictability for the market and as such can trigger investments in new mitigation projects, as well as preserve investor confidence in UNFCCC market mechanisms. Finally, an orderly transition from the CDM to the Article 6.4 Mechanism will result in a kick-start mitigation achieved as it will enable the Article 6.4 Mechanism to come into use from the get-go.⁹⁵

At the same time, CDM transition raises environmental integrity concerns, as it might undermine the climate change mitigation ambitions of Parties under the Paris Agreement as communicated through their NDCs. For example, transition of CDM activities that no longer require a CER revenue stream because a technology has become widely available and financially competitive and therefore no longer needs support via crediting.⁹⁶ A second scenario is that certain activities are no longer additional in the context of a host country's NDC, and therefore will effectively result in a lower mitigation ambition under the Paris Agreement as a result of the transition.⁹⁷

Whereas it seems certain that CDM transition into the Paris Agreement will take place in some shape or form, there are ongoing negotiations on what this transition should look like. In the SBSTA negotiations, Parties are

⁹⁵ S. Greiner et al (2017) [CDM Transition to Article 6 of the Paris Agreement](#), Options Report

⁹⁶ S. Greiner et al (2017) [CDM Transition to Article 6 of the Paris Agreement](#), Options Report

⁹⁷ S. Greiner et al (2017) [CDM Transition to Article 6 of the Paris Agreement](#), Options Report

trying to balance the advantages to transitioning (certain aspects of) the rules and procedures of the CDM, against the concern that transition will lead to lower mitigation ambition or dilute efforts of NDCs.

For simplicity, negotiations on CDM transition is here divided into three separate, but closely linked issues: the transitioning of activities, the transitioning of credits, and the transitioning of rules.

The transition of CDM activities to the Article 6.4 Mechanism could allow existing CDM activities to continue their operation under the Article 6.4 Mechanism. In this scenario, emission reduction credits that are, after transition, generated under these activities could be used by countries towards their NDC. For Peru, allowing the transition of CDM activities to the Article 6.4 Mechanism would enable its CDM projects, and notably their six waste-sector projects, to continue operation after 2020, and contribute to the achievement of the emission reduction targets under the Peruvian NDC.

It is likely that a transitioned CDM activity will need to be aligned with the newly established Article 6.4 rules, which might require adjustments to a Project or Programme design, e.g.: changing the length of an activity's crediting period. Alignment could be required at a specific point in time, such as one year after transition, and can be confirmed through an eligibility check. It seems likely that emission reductions generated before the migration date will be counted under the Kyoto Protocol, whereas credits generated after the migration date will be counted towards NDCs under the Paris Agreement.⁹⁸

To avoid double counting of generated emission reductions, a clear handover moment between the CDM and Article 6.4 Mechanism will be necessary. Parties can decide on a single migration date, or the migration date can be set independently for individual activities. It seems likely that the CDM Executive Board (CDM EB) will not be required to approve the migration of individual activities if Parties agree on the transition of CDM activities. At the same time, the CDM EB should be informed after migration that an activity has stopped under the CDM, and it is expected that migration of an activity would require approval of the host country. Finally, to prevent the transition of CDM activities adversely affecting environmental integrity of the Article 6.4 Mechanism, for example by migrating activities that are no longer additional, Parties (or the Article 6.4 Supervisory Body) could partially limit migration, e.g. by technology type, geographical location or eligible years.

The transition of CERs refers to transitioning of emission reduction credits issued under the CDM to the Article 6.4 Mechanism, which can then be used for NDC compliance. The transition of CERs would ensure their post-2020 value, thereby potentially enhancing pre-2020 mitigation action. Transitioning CERs gives a country greater flexibility in meeting emission reduction targets⁹⁹, which provides an opportunity for Peru given the large number of CDM projects implemented in the country. At the same time, CER transition raises environmental integrity concerns, and would require clear quantitative and qualitative restrictions to avoid reducing NDC ambition.

Parties could decide to limit the transition of CERs to credits generated as part of a CDM activity that is eligible for migration to the Article 6.4 Mechanism. Another option is to allow for 'carry over' or 'banking' of CERs

⁹⁸ S. Greiner et al (2017) [CDM Transition to Article 6 of the Paris Agreement](#), Options Report

⁹⁹ S. Greiner et al (2017) [CDM Transition to Article 6 of the Paris Agreement](#), Options Report

issued pre-2020, which have not been used for Kyoto compliance. These CERs would not necessarily have to be linked to CDM activities eligible for migration.

Transitioning CDM rules refers to the extent to which modalities and procedures covering the CDM could be immediately adopted under the Article 6.4 Mechanism, or whether Parties need to revisit them. Transitioning CDM rules provides an opportunity to ease potential transition of CDM activities into the Article 6.4 Mechanism and can simplify participation of CDM projects in the Article 6.4 Mechanism from the get-go, as project implementers can easily build on their CDM experience.

At the same time, Parties risk importing shortcomings¹⁰⁰ in the CDM rules into the Article 6.4 Mechanism. Based on the negotiations thus far, it seems unlikely that the CDM rulebook will be transitioned 'as is' to the Article 6.4 Mechanism. The different set-up of the Article 6.4 Mechanism compared to the CDM¹⁰¹ requires adapted rules, modalities and procedures. Given that Parties have sought reforms of the CDM before,¹⁰² it is likely that negotiators will take this opportunity to try and improve the system. Finally, the concluding informal note¹⁰³ on Article 6 at COP23 represents a first step towards the development of new rules, modalities and procedures for the implementation of the Article 6.4 Mechanism. Seeing that Parties agreed that the Article 6.4 Mechanism modalities and procedures should be based on "experience gained with and lessons learned from existing mechanism and approaches under the Convention (...)"¹⁰⁴, there is likely to be a certain degree of similarity between the rules that govern the CDM as well as JI (including the Work undertaken by the Subsidiary Body for Implementation on the review of the joint implementation Guidelines), and the Article 6.4 Mechanism.¹⁰⁵

The degree of compatibility between the CDM and JI rules with the design of the Article 6.4 Mechanism differs for the various Article 6.4 provisions and can be assessed insofar as negotiations have provided clarity on how the Article 6.4 Mechanism will look.¹⁰⁶ Regarding the participation of Parties and the governance structure, the Article 6.4 Mechanism is likely to be compatible with the CDM. In both mechanisms, Parties participate voluntarily, and like the CDM, the Article 6.4 Mechanism will have a supervisory body designated by the Parties. Additionally, Article 6.4 mentions the continued involvement of DOEs in the verification and certification of emission reductions. Moreover, although not specifically mentioned in Article 6.4, it is likely that a registry will be established with similar features to the CDM Registry.

An important differentiation between the CDM and Article 6.4 Mechanism is the stated purpose of the two mechanisms. Whereas the CDM aims for cost-effective mitigation and sustainable development, the Article 6.4 Mechanism wants to incentivize mitigation and higher ambition, as well as

¹⁰⁰ S. Greiner et al (2017) [CDM Transition to Article 6 of the Paris Agreement](#), Options Report

¹⁰¹ See Table 7 for the main differences between the CDM and Article 6.4 mechanism

¹⁰² S. Greiner et al (2017) [CDM Transition to Article 6 of the Paris Agreement](#), Options Report. See, for example, the report of the High-Level Panel on the CDM Policy Dialogue (2012) [Climate Change, Carbon Markets and the CDM, A Call to Action](#). An overview of CMP decisions can be found [here](#).

¹⁰³ Informal note by the co-chairs (2017) Draft elements for SBSTA agenda item 11 (b) [Rules, modalities and procedures for the mechanism established by Article 6, paragraph 4 of the Paris Agreement, Third iteration, 12 November 2017](#)

¹⁰⁴ UNFCCC COP [Decision 1/CP.21](#) para 28(f)

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¹⁰⁶ Please refer to S. Greiner et al (2017) [CDM Transition to Article 6 of the Paris Agreement](#), Options Report. Annex Article 6.4/CDM comparison for a full comparison of the two mechanisms

sustainable development. This difference in purpose, compliance with pre-established targets versus incentivizing higher ambition, is likely to require an adapted set of rules. This is also likely to hold true in terms of the eligibility for participation, given that the CDM differentiates between the participation of Annex I and Non-Annex I Parties, and that Article 6.4 does not make this distinction. Another likely new feature of the Article 6.4 Mechanism is that baselines and additionality will be established in the context of NDCs.

Finally, in several areas it is likely that the CDM will only have to be slightly modified in order to conform with the Article 6.4 Mechanism. While the CDM is only used for projects and PoAs, the Article 6.4 Mechanism is potentially applicable to broader approaches. Additionally, Article 6.4 requires an overall mitigation in global emissions, whereas this was 'feasible but not required' by the CDM.

4.3 Pilot initiatives and potential market demand

Several pilot programs or activities that could eventually pursue an Article 6.2 or 6.4 route already exist. These pilots can be clustered into the following categories: activities or programs already in place, new crediting initiatives explicitly aimed at testing possible Article 6 transfers, initiatives with the goal of linking Emission Trading Schemes (ETS) via Article 6.2 transfers, Results-Based Climate Finance (RBCF) initiatives, and other climate finance initiatives not intended for transferring ITMOs and not results-based.¹⁰⁷

Activities or programs that are already running and could possibly fall under Article 6.2 include Japan's Joint Crediting Mechanism (JCM), the Carbon Partnership Facility (CPF), the Forest Carbon Partnership Facility (FCPF), the World Bank's Climate Carbon Initiative for Development (Ci-Dev) in Senegal and Rwanda (that also includes a post-2020 crediting element and could potentially fit under Article 6.2 or 6.4).¹⁰⁸

New crediting initiatives aiming to test Article 6 transfers include Transformative Carbon Asset Facility (TCAF)¹⁰⁹ and the Swiss Climate Cent Foundation Article 6 activities.¹¹⁰ While still undecided and not formally proposed as an Article 6 pilot, the European Bank for Reconstruction and Development (EBRD), by collaborating with several countries (Morocco, Jordan, Egypt and Tunisia), intends to develop a system which could eventually fall under Article 6.2 transfers.

Initiatives with the goal of linking ETS via Article 6.2 transfers include transactions between Switzerland and EU ETS, or the World Bank's Networked Carbon Markets (NCM) that also seeks possible linkages. RBCF initiatives have not been involved in crediting and transfers, but there is potential for structuring these similarly to crediting programs or to have them aim for similar mitigation outputs. The second phase of the Pilot

¹⁰⁷ Spalding-Fecher, Randall (2017) Pilot Activities on Article 6.2 of the Paris Agreement. Carbon Limits.

¹⁰⁸ Spalding-Fecher, Randall (2017) Pilot Activities on Article 6.2 of the Paris Agreement.

¹⁰⁹ The TCAF supports developing countries in increasing their mitigation ambition and assists countries to implement market-based carbon pricing and sectoral mitigation measures. TCAF is testing various methods to transfer mitigation outcomes and provide stringent accounting and transparency, thereby ensuring the environmental integrity of the assets. For more information please refer [here](#).

¹¹⁰ The Climate Cent Foundation invests in greenhouse gas reduction schemes carried out abroad. It mainly supports projects whose emission reductions can be determined according to internationally recognised principles and imputed by Switzerland toward fulfilling its reduction target. The Foundation is currently pursuing four activities that will make use of Article 6 of the Paris Agreement. For more information please refer [here](#).

Auction Facility (PAF post-2020) could be an example in this case.¹¹¹ The PAF has utilised CDM as a standard to quantify the mitigation outcome of the supported activities.

Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)

Future demand for carbon credits could derive from various sources. The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) is one example that could trigger a potentially major post-2020 market for offset credits. The following section provides a literature review of potential post-2020 carbon market demand as well as the demand CORSIA can generate. To what extent Peru could possibly participate and benefit from CORSIA is also briefly discussed, in order to outline opportunities for engagement.

Member States agreed to establish CORSIA in October 2016, at the 39th Assembly of the International Civil Aviation Organization (ICAO). CORSIA is a global market-based measure to offset CO₂ emissions from international aviation and aims to stabilize net emissions at 2020 levels. Any additional emissions above the average of 2019-2020 levels generated by international routes between participating States are to be offset.

Implementation will take place across three phases: (1) the pilot phase (2021-2023), which applies to States that have volunteered to participate in the scheme; (2) the first implementation phase (2024-2026), which is also voluntary in nature; and (3) the second implementation phase (2027-2035), which is mandatory for all Member States. As of November 2017, 72 States – representing about 87.7% of international aviation traffic – announced their intention to participate in the pilot phase. This suggests that the initial coverage of the scheme will already be substantial and may have significant implications on demand for eligible carbon offsets.¹¹²

With a view to promoting the use of emissions units that benefit Developing States, aircraft operators will be required to offset emissions by purchasing carbon credits generated by various emission reduction programs and projects across the globe,¹¹³ either in the primary or secondary market.¹¹⁴ In this context, ICAO emphasizes that *“participating in CORSIA will increase the demand for the emissions units to be purchased by aircraft operators, thus increasing incentives to invest in emissions reduction projects”*.¹¹⁵

Due to CORSIA’s broad scope and growth projections for the global aviation sector, a relatively strong market demand for offsets may be expected as the scheme progresses. According to a demand forecast presented by the Committee on Aviation Environmental Protection (CAEP) in January

¹¹¹ Spalding-Fecher, Randall (2017) Pilot Activities on Article 6.2 of the Paris Agreement.

¹¹² United Nations Framework Convention on Climate Change (UNFCCC). 2017. SBSTA 47, Agenda Item 10 (b)

¹¹³ International Civil Aviation Organization (ICAO) (2016) [Assembly 39th Session](#). Resolution 39-3 is silent about the need for States to participate in CORSIA as a condition to become eligible to sell offsets under the scheme. Moreover, while Article 21 determines that emissions units generated from mechanisms established under the UNFCCC and the Paris Agreement are eligible for use in CORSIA.

¹¹⁴ South Pole Group (2017) [Guidance on CORSIA](#)

¹¹⁵ See International Civil Aviation Organization (ICAO) [Benefits for CORSIA participation](#) Accessed on 19 January 2018. Here, Article 24 of Assembly Resolution 39-3 requests the ICAO Council to promote the use of emissions units that benefit developing States.

2016,¹¹⁶ yearly demand is estimated to be in the range of 142 MtCO₂ to 174 MtCO₂ during the initial phases (from 2021 to 2026), increasing to at least 443 Mt CO₂ per year throughout the second phase (starting in 2027). Thus, CORSIA could lead to a cumulative global demand between 3.4 and 4.5 GtCO₂e by 2035.¹¹⁷

According to the Technical Analysis carried out by CAEP and presented to the ICAO Environment Advisory Group in January 2016, Peru's participation in CORSIA from the start can provide considerable financial benefits at a relatively low cost. In a conservative demand scenario post-2020, where carbon prices are expected to range from 6 to 10 US\$/tCO₂, Peru would receive US\$522 million in additional revenue at a cost of US\$24 million to the national aviation industry over the period 2021 to 2026.^{118,119} Early action would also help expand the demand for offsetting credits.

Peru also has an opportunity to benefit from the demand for emission reduction credits generated through CORSIA. The CORSIA Emissions Unit Eligibility Criteria, which are expected to be announced in December 2018, will determine to what extent Peru will be able to reap the benefits from this new market demand. What is clear at this stage is that aircraft operators bound by offsetting requirements will, under CORSIA, be able to source emission units from various sectors (thus, not limited to domestic aviation offsets), and from different types of offset credit programs. The following table offers an overview of different estimations of potential offset demand post-2020 under CORSIA.

Table 8 – Estimated post-2020 offset demand from CORSIA

Source	Period	Estimated offset demand
Arvanitakis, A.; Dransfeld, B.: <i>Design of an Offset System as Global MBM Scheme for international Aviation in the Light of the Paris Agreement, 2017</i> ¹²⁰	2021 - 2035	3.4 – 4.5 GtCO ₂ e
World Bank and Ecofys: <i>Carbon Pricing Watch, 2017</i> ¹²¹	2021 - 2035	2.4 – 2.7 GtCO ₂ e
Climate Advisers: <i>Linking the ICAO Global Market-Based Mechanism to REDD+ in Peru, 2017</i> ¹²²	2021 - 2035	2.4 GtCO ₂ e
Stockholm Environment Institute (SEI): <i>Supply and sustainability of carbon offsets and alternative fuels for international aviation, 2016</i> ¹²³	2021 - 2035	3.3 – 4.5 GtCO ₂ e
Oeko-Institut e.V.: <i>CORSIA: Availability of offsets for a global market-based mechanism for international aviation, 2015</i> ¹²⁴	2021 - 2035	3.3 GtCO ₂ e

¹¹⁶ ICAO (2016) Environment Advisory Group Meeting (EAG/15): [Results of Technical Analyses by CAEP, 2016](#)

¹¹⁷ Arvanitakis, A., Dransfeld, B (2017) [Design of an Offset System as Global MBM Scheme for International Aviation in the Light of the Paris Agreement](#). German Emissions Trading Authority (DEHSt)

¹²⁰ Arvanitakis, A., Dransfeld, B (2017) [Design of an Offset System as Global MBM Scheme for International Aviation in the Light of the Paris Agreement](#). German Emissions Trading Authority (DEHSt)

¹²¹ World Bank and Ecofys (2017) [Carbon Pricing Watch, 2017](#)

¹²² Climate Advisers (2017) [Linking the ICAO Global Market-Based Mechanism to REDD+ in Peru](#).

¹²³ Stockholm Environment Institute (2016) [Supply and sustainability of carbon offsets and alternative fuels for international aviation](#).

¹²⁴ Oeko-Institut e.V. (2015) [CORSIA: Availability of offsets for a global market-based mechanism for international aviation](#)

Other potential sources of demand for emission reduction credits

Drawing a complete picture of the international carbon market outlook post-2020 at this stage remains challenging. This is mainly due to the lack of information on the impact of NDCs, the structure of the carbon markets after 2020, and the cumulative effect these issues will have on price development over time.

Limited research has been done to assess how the global supply and demand dynamics of international carbon markets may evolve in relation to Article 6.2 of the Paris Agreement.¹²⁵ Table 9 presents the results of an analysis of the INDCs submitted so far by both Annex I and non-Annex I countries which sheds insight into the role international carbon markets are to play in respective submissions.

Table 9 - Intention to use International Carbon Markets expressed in INDCs

International Carbon Markets in INDCs			
Intended use	Developed countries	Developing countries	TOTAL
No	32	12	44
Not Specified	2	52	54
Not in INDCs, but in the longer term		7	7
Future consideration			
Yes	2	15	17
Yes	10	57	67

Source: Table adapted from Cames, M. et. al. (2016) International Market Mechanisms after Paris: Discussion Paper. German Emissions Trading Authority (DEHSt)

Out of the 84 countries that have expressed their intention or consideration to use international carbon markets, the vast majority corresponds to developing countries which have not yet clarified whether they will purchase or sell ITMOs towards fulfilling their NDCs. Among them, it is likely that those with a conditional target are already expected to use international carbon markets as a means to mobilize the required financial support. On the other hand, while large emitters in both emerging and developed economies have already decided they will opt out,¹²⁶ only a handful of developed countries have clearly stated their intention to use cooperative approaches under Article 6.2, including Mexico, Japan, Canada, Switzerland, New Zealand, Norway, and South Korea. As things currently stand, it is likely that potential supply may exceed future demand for international carbon market units.

¹²³ Stockholm Environment Institute (2016) [Supply and sustainability of carbon offsets and alternative fuels for international aviation](#).

¹²⁴ Oeko-Institut e.V. (2015) [CORSlA: Availability of offsets for a global market-based mechanism for international aviation](#)

¹²⁵ Obergassel, W. & Gornik, M. (2015) [Update on the role of market mechanisms in intended nationally determined contributions](#); and Rocamora, A. (2016) [IGES INDC & NDC Database](#)

¹²⁶ Cames, M. et. al. (2016) [International Market Mechanisms after Paris: Discussion Paper](#). German Emissions Trading Authority (DEHSt) Almost a quarter of countries included in the analysis stated that they do not intend to use the international carbon market. These are: European Union, Malaysia, Norway, Russian Federation, Serbia, United States, Venezuela, and a number of small island states.

5. Possible arrangements and incentives

The successful engagement with international carbon markets, and in particular cooperative approaches under Article 6 of the Paris Agreement, will require adequate and transparent arrangements by countries at the domestic and bilateral level. These arrangements will need to cover in the case of Peru, the following among other aspects:

- A transaction structure that is able to accommodate Peru's interests and goals when transferring mitigation outcomes and, at the same time, attract further international investments by partner countries and investors
- An arrangement for sharing mitigation outcomes from the solid waste sector between Peru and partner countries (and other potential investors) that creates the necessary incentives for participation in the long-term
- Transparent and clear rules for applying corresponding adjustments and avoiding double-counting when mitigation outcomes are transferred and used outside Peru
- Considerations of the best options for creating incentives for domestic private sector entities operating in the solid waste sector in Peru.

The first two aspects focus on incentives and ways for structuring transactions and sharing mitigation benefits. The third is associated with robust accounting and the environmental integrity of mitigation outcomes produced in Peru. The fourth seeks to secure the long-term financial sustainability of mitigation actions being unlocked by international climate and carbon finance.

5.1. Structuring the transfer of mitigation outcomes

Different arrangements and transaction types are available for sellers (including host countries) to transfer ITMOs to a partner country or investor, and to tap into an additional revenue stream to carry-out mitigation actions. These include a simple forward sale and purchase, a forward sale and purchase coupled with an upfront payment, the use of a (call or put) option agreement, and more innovative structures such as buy-back arrangements. The selected arrangement may also entail a combination of different features from these transaction types.

Possible transaction structures

A simple forward sale and purchase of ITMOs entails an arrangement whereby the contracting parties agree to a specific price and a future date for delivering an agreed volume of ITMOs. On the agreed date, the seller delivers the contracted ITMOs and the buyer pays for those ITMOs delivered. These forward contracts would be entered into prior to the generation of ITMOs.

Alternatively, a seller could opt to wait until ITMOs have been produced and agree on a spot transaction with a buyer. While spot transactions remove the ITMO-generation risk from the equation, they are not suitable for sellers seeking to obtain upfront finance to implement their GHG mitigation activities. In such cases, a forward sale and purchase would be more suitable.¹²⁷

Forward contracts can also give sellers more predictability with respect to the total revenues that can arise from any given contract. This predictability is important for leveraging additional finance and for the planning ahead of the implementation of activities on the ground. Contracting parties can also negotiate so that a portion of the payments are made in advance to the seller. However, forward contracts with an advance payment often impose an obligation on the seller to return the advance payment plus interest if emission reductions are eventually not generated or not delivered as agreed in the contract (Table 10).

Table 10 – Forward vs. spot transactions in carbon markets

Forward contract	Spot transaction
Long-term agreement with delivery agreed at a future date (ITMOs not produced yet)	Short-term agreement with near immediate delivery and payment (for ITMOs already produced/issued)
May or may not require firm delivery obligations and guaranteed volume	Imposes firm delivery obligations and guaranteed volume
Suitable for negotiating advance payments or to use as collateral	Not suitable for advance payments or to use as collateral
Cash flow and revenues are more predictable but occur at some point in the future	Cash flow and revenues will vary with the price negotiated at the moment of transfer, with immediate payments

Option contracts (i.e. a call or put option) can also be employed in certain cases, either in conjunction with a forward contract or as a stand alone agreement. A call option would entail a right, but not an obligation, to buy an ITMO (i.e. the buyer has a choice whether or not to buy and the seller must sell if the buyer wishes to buy). A put option, in turn, would entail a right, but not an obligation to sell (i.e. the seller has a choice whether or not to sell and the buyer must buy if the seller wishes to sell). These options give considerable flexibility to the holder of the option and therefore entail the payment of a premium for the optionality the moment that an agreement is reached.

¹²⁷ Some banks may also be willing to provide finance on the basis of a signed forward sale and purchase agreement (where the revenues from this agreement are assigned to the relevant bank as collateral)

In carbon markets, options can serve to accommodate uncertainties associated with the future use of emission reductions for ‘compliance’ under different regulated regimes (e.g. Kyoto, Paris, CORSIA) and to hedge for the price risk in carbon trading. Similar to a forward sale and purchase with an advance payment, call options used in carbon markets can sometimes be tailored to provide substantial upfront payments to project developers (in the form of a call option premium), while maintaining certain flexibility for the buyer to choose whether or not to eventually purchase the credits by paying the strike price (also known as exercise price) upon maturity of the agreement (Table 11).

Table 11 – Forward contracts vs call options in carbon markets

Forward contract with advance payment	Call option with a call option premium
Long-term agreement. Delivery date and price agreed at the moment the contracting parties enter into the agreement	Long-term agreement. Dates for the exercise of the call option and strike price agreed at the moment the contracting parties enter into the agreement
May or may not establish firm delivery obligations and guaranteed volumes. More recent carbon market forward contracts often avoid imposing penalty payments on seller (save for intentional breach)	May or may not establish firm delivery obligations and guaranteed volumes. Certain carbon market option contracts avoid imposing penalty payments on seller (save for intentional breach)
May be coupled with an advance payment (amount to be negotiated with buyer). Where the value is substantial, advance payment can be paid in tranches	Entails the payment of a call option premium upfront by the buyer (amount to be negotiated with buyer). Where the value is substantial, premium can be paid in tranches
Buyer must purchase the contracted volume of ITMOs generated. Provides greater predictability to seller with respect to future revenues. It is less attractive for buyers who want to avoid committing to purchase ITMOs before assessing unit quality aspects, the possibility of hot-air transfer, or long-term lock-in of capital	Buyer may or may not purchase ITMOs generated. Provides less predictability to seller with respect to future revenues. A higher call option premium value can, however, mitigate this risk for the seller. If call option is not exercised, ITMOs may be used by seller for own NDC (over-) achievement or sold to third-parties
Unit price fixed ex-ante. Market price risk borne by both seller and buyer	Strike price fixed ex-ante. Market price risk is reduced for the buyer
If the seller cannot generate or does not deliver ITMOs (despite its best efforts), advance payment often needs to be repaid by the seller, plus interest	If the seller cannot generate or does not deliver ITMOs (despite its best efforts), upfront resources already disbursed do not need to be repaid by the seller

In the end, the optimal transaction type will be one that is able to safeguard Peru’s interests and incentives for engaging in new international market mechanisms, but which remains attractive enough for partner countries and potential international buyers. The selected transaction type will, therefore, need to strike a balance between hard contractual obligations and commercial conditions, including whether or not upfront resources are provided to the host country, the amount of upfront resources available, and the final price for each ITMO delivered. Furthermore, the more involved a buyer becomes in the process of creating ITMOs (as opposed to buyers that act as a mere off-takers of emission reductions or ITMOs), the greater are

the possibilities for building trust among contracting parties and increasing the provision of technical and financial capacities to the host country.

Below we outline some of the key aspects that need to be accommodated in a potential transaction between Peru and a partner country or another international buyer and then embodied in a **Mitigation Outcome Sale and Purchase Agreement (hereinafter referred to as “MOPA”)**. Given the limited scope, these are presented here in a non-exhaustive and summarized manner. Section 6 builds on these considerations to suggest a (possible) conceptual pilot transaction structure between Peru and a partner country or other potential international buyers.

Priority to the achievement of Peru's NDC

Peru's willingness to engage in the transaction of ITMOs (whether through Article 6.2 or 6.4) is likely to depend on whether the transaction assists the country in achieving its own NDC and supports the private sector in further investing in the country's solid waste sector. Peru will, however, need to steer between two risks: (i) avoiding the transfer of emission reductions that the country may need to achieve its own NDC; and (ii) finding new revenue streams to enhance market readiness and carryout the necessary actions to over-achieve the NDC. Any transaction that Peru considers, therefore, will need to be based on a general bilateral rule of 'priority use by the host country'.¹²⁸ This could help ensure that sufficient emission reductions stay with Peru and are accounted towards the country's NDC.

One way of ensuring a priority use by Peru is to design the transaction as a conditional sale. Peru and the buyer can, for instance, agree to establish conditions that need to be met before the sale of ITMOs becomes fully effective. One such condition could be Peru being on track to over-achieve its NDC by a certain (pre-agreed) surplus. Indicative (non-binding) multi-year emissions trajectories could be established bilaterally for tracking overall progress in achieving the NDC. As the transfer of ITMOs by Peru would be contingent on the country being on track to over-achieve its NDC as a whole, Peru would not be compromising the fulfilment of its own NDC. Conditions precedent of this nature may be employed in MOPAs that are more seller-friendly and focused on establishing a long-term cooperation between the contracting parties.

However, certain buyers may feel that this structure would excessively increase the ITMO-generation risk. In order to achieve a compromise and accommodate possible buyer's concerns, the contracting parties could negotiate to make the ITMO transfer conditioned on the performance of the waste sector alone (as opposed to the performance of all NDC-covered sectors). This could increase risks for Peru but reduce considerably the risks shouldered by international buyers (and thus lead to a stronger negotiation position of the seller). Another incentive for buyers lies in securing first-rank rights to quality ITMOs that may be produced by Peru up to a certain pre-agreed surplus. Also, the adoption of a portfolio or sectoral crediting approach (instead of a focus on individual landfill projects) could make this option more attractive to potential buyers, reducing overall transaction costs and allowing for the transfer of blocks of mitigation outcomes.

¹²⁸ C. Streck et al. (2017) [Options for enhancing REDD+ collaboration in the context of Article 6 of the Paris Agreement](#). Meridian Institute

The above considerations on transaction types and conditions (and the underlying flexibility in designing bilateral transaction rules) are of course dependent on the CMA guidance that emerges internationally. Some of the aspects related to ensuring and maintaining consistency with international guidance are discussed further below.

Upfront payments and the use of proceeds

Even when ITMOs are only transferred to a partner country or international investor at certain pre-agreed future dates, funds could still flow to Peru upfront and upon the country meeting certain payment milestones agreed between the parties. Contracting parties may negotiate this upfront payment as advance payments in a forward sale and purchase agreement or in the form of a call option premium in a call option agreement. A portion of upfront payments may also be provided in the form of concessional loans. In this case, part of the upfront payments would correspond to the call option premium and another part to a soft loan to be repaid through the delivery of ITMOs (if available) and cash payments.

In any case, when agreed upfront payments are substantial in value, the contracting parties are likely to agree to and define specific milestones for the release of resources through a set of tranches (i.e. output-based payments). Examples of possible milestones include:

- Ensuring that Peru has in place the relevant regulations and systems to promote (public and private sector) action at municipal level;
- Establishment of a domestic financing mechanism to receive, manage and disburse upfront funds to local activities;
- Establishment of indicative multi-year emissions trajectories at national and sectoral level (agreeable to both parties);
- Peru having met its reporting obligations pursuant to the current and emerging international MRV rules (and that the host-country following-up on any of the recommendations from expert review teams and the facilitative sharing of views);and/or
- Peru having its domestic MRV and registry system in place.

The use of upfront resources could also be regulated within the MOPA. The contracting parties could specify, for instance, that all payments disbursed upfront are to be reinvested in the solid waste sector and used to unlock further private sector finance. This could be modelled, for instance, after the provisions applied under the Kyoto Protocol by certain Green Investment Scheme (GIS) transactions to govern the receipt, disbursement and use of revenues for greening activities. These would often include rules clearly specifying:

- Targeted mitigation activities;
- Eligibility of projects, including criteria associated with project level baseline and additionality;
- Applicable financial instruments used (including amount of grant components);
- Supporting legal framework that may be required through the enactment of domestic regulations;

- Monitoring and quality assurance procedures, which may include the appointment of an independent auditing firm to regularly audit the disbursement of the proceeds.

Achieving and maintaining consistency with international guidance

Any tailored arrangement potentially adopted by Peru and a partner country (or another international buyer) will need to ensure consistency with emerging international rules. Article 6.2 guidance and/or Article 6.4 rules will need to be observed, along with other relevant international provisions on NDC and ITMOs accounting and reporting under the Enhanced Transparency Framework.¹²⁹

Where a transaction follows the Article 6.4 route, bilateral arrangements will need to contain provisions that mirror the modalities and the activity-cycle sanctioned internationally for the Article 6.4 Mechanism. In several aspects Article 6.4 Mechanism transactions are likely to resemble JI Track 2 transactions. The underlying mitigation activities are likely to be verified by an internationally accredited verifier, registered with the (future) Article 6.4 Mechanism's supervisory board, and potentially also be issued with the support of a centralized transaction log and registry system. While this means less flexibility for contracting parties to structure their bilateral arrangements, it offers countries and private entities an internationally accepted standard for the generation and transfer of emission reductions.

The Article 6.4 Mechanism may thus become an interesting international route for Peru during the period in which the real stringency of its NDC target is still being assessed and its domestic MRV framework is under construction. The country could quickly build on the CDM infrastructure already in place and attempt to re-ignite the interest of private sector players that are already familiar with the CDM. Moreover, to the extent that CDM transition becomes an option, Peru could pursue a possible fast-track process and 're-register' its existing CDM activities under Article 6.4. This may however entail adjustments to project baseline and additionality in light of the country's NDC pledges (see Box 1 below).

In turn, if Peru opts to follow the Article 6.2 route, the contracting parties would likely have greater discretion in designing and setting inter-party rules. For instance, contracting parties may potentially dispense using a fully-fledged registry system or a centralized transaction log and opt to transfer and acquire ITMOs on the basis of independently verified emissions reductions and the use of common standardized reporting tables (potentially agreed under Article 6.2 guidance).¹³⁰ On the other hand, contracting parties would have to be more precise and detailed about the provisions governing the transaction and ensuring environmental integrity of ITMOs. The guidance provided by the CMA under Article 6.2 would thus have to be clearly and transparently operationalized at bilateral level.

For both routes, but in particular for Article 6.2, Peru would also need to be prepared to follow or have implemented certain readiness elements that might apply, which would need to be reflected in the bilateral transactions.

¹²⁹ The operationalization of Articles 4.8, 4.13 and 13.7 of the Paris Agreement will be of particular relevance.

¹³⁰ See in this respect C. Streck et al. (2017) [Options for enhancing REDD+ collaboration in the context of Article 6 of the Paris Agreement](#). Meridian Institute

These possible participation requirements could entail, among others:

- Authorizing the use of ITMOs domestically;¹³¹
- Submitting its transparency biennial reports timely, including a time series of emissions;
- Installing a system for identifying the origin of ITMOs and tracking the acquisition and international transfer of ITMOs; or
- Installing a system for recording the use of ITMOs or establishing an accounting balance.¹³²

In addition to these aspects, the contracting parties would also need to design more specific arrangements for (i) the sharing of mitigation outcomes between them; (ii) ensuring corresponding adjustments are timely and adequately made; and (iii) enticing the participation of the private sector. Given their importance, these three aspects are addressed separately below.

Box 1 – Risks associated with the transition of existing CDM activities

Developing countries could potentially be allowed to transition their (registered) CDM activities into the Article 6.4 Mechanism, if this becomes an option emerging out of the Article 6.4 modalities and procedures. Possible new requirements on the setting of crediting baselines in the post-2020 climate regime could, however, put the transition of CDM activities into jeopardy.

While additionality and baselines have yet to be defined under Article 6.4, their operationalization could be different from how they have been implemented under the CDM. Possible variations include, for instance, that crediting baselines be set and revised in a way that reflects NDC targets and their increased ambition over time. For host countries and project developers this may imply a risk that existing CDM activities have their baselines revised downwards, leading to fewer creditable emission reductions. Another possible interpretation is that certain existing CDM activities be deemed non-additional if they fall within the unconditional part of a host country's NDC (as the country has, in theory, pledged to achieve this target without any external support).

5.2. Arrangements for sharing mitigation outcomes

As discussed, the appropriate level of engagement by Peru with international carbon markets depends first and foremost on the extent to which the country itself requires the emission reductions for its own NDC achievement. This is contingent upon elements such as the performance of other key sectors covered by the NDC (in particular LULUCF), and the costs associated with the different abatement opportunities, as well as the availability and terms of international support.¹³³

Bilateral arrangements for sharing emission reductions or ITMOs are also closely related to discussions on the attribution for mitigation results

¹³¹ Pursuant to Article 6.3 of the Paris Agreement.

¹³² Informal note by the co-chairs (2017) Draft elements for SBSTA agenda item 11 (a) [Guidance on cooperative approaches referred to in Article 6, paragraph 2, of the Paris Agreement](#), 6 November 2017.

¹³³ See in this respect, C. Streck et al. (2017) [Options for enhancing REDD+ collaboration in the context of Article 6 of the Paris Agreement](#). Meridian Institute.

achieved, avoiding double claiming and double payment for the same emission reductions and allowing for an increase in mitigation ambition. It is crucial, therefore, that a possible transaction between Peru and a partner country or another international buyer pays particular attention to this and clearly delineates how the mitigation outcomes achieved by the solid waste sector will eventually be shared. Options could include:

- i. Layering of international climate and carbon finance to integrate different streams of finance in a complementary and transparent manner, clearly allocating mitigation outcomes between Peru and international financiers and carbon market players;
- ii. Having mitigation outcomes attributed to a partner country during a limited period of time (e.g. during the first NDC cycle), after which all mitigation outcomes would accrue only to Peru; and
- iii. Considering the possibility of a joint NDC between Peru and a potential partner country as a means to stimulate new forms of collaboration between countries. This may become an interesting alternative to Peru and a partner country seeking ways to cooperate in more than one NDC-covered sector (e.g. the Peruvian waste and forestry sectors).

The first option could be developed through an arrangement in which Peru agrees to finance and implement (with domestic public/private resources) a certain component of the mitigation intervention, and the partner country and/or international investors agree to support the remaining components via international climate finance and carbon markets.

As an illustration, Peru could commit to implement and operate a certain portfolio of landfills and the partner country could provide the international climate finance needed for the acquisition, installation and operation of flaring systems in those same landfills. All mitigation outcomes achieved through this arrangement could be used towards Peru's unconditional and conditional NDC target (and accounted for by Peru only), with the amounts disbursed by the partner country being recorded as international climate finance. Carbon markets could also be integrated with the partner country to provide additional support for the implementation of waste-to-energy solutions. The portion of the emission reductions attributed to the energy generation component could then be converted into ITMOs and (eventually) transferred to the relevant partner country.

For the second option, parties could agree to allocate all mitigation outcomes resulting from the relevant solid waste sector intervention (i.e. the Solid Waste Sector NAMA or a set of pre-agreed mitigation activities) in the first NDC period to a partner country or international buyer. For all subsequent NDC periods, emission reductions would accrue exclusively to Peru and assist the country in (over-)achieving subsequent NDC targets.

In any of the scenarios above, the contracting parties could also specify a portion of emission reductions to be cancelled by either Peru and/or by the buyer after receiving the ITMOs. This could help ensure that the cooperation leads to a degree of overall mitigation that goes beyond offsetting.¹³⁴ While achieving overall mitigation in global emissions (OMGE) is an international requirement under the Article 6.4 Mechanism, this notion could also be adopted for cooperative approaches under Article 6.2.

¹³⁴ C. Streck et al. (2017) [Options for enhancing REDD+ collaboration in the context of Article 6 of the Paris Agreement](#). Meridian Institute.

Agreeing bilaterally to cancel a portion of ITMOs could be one way of operationalizing the OMGE concept and an opportunity for Peru and a buyer to set a more robust and ambitious example for the international community. This model could then eventually be replicated with other partner countries and international buyers.

Finally, the third option outlined above – the submission of a joint NDC – would be based on Articles 4.16-4.18 of the Paris Agreement. The cooperating countries could communicate to the UNFCCC Secretariat the terms of their agreement, including the emissions level allocated to each Party and relevant time period for fulfilment of the joint NDC target. While each country would still be responsible for their allocated targets individually, Peru and the partner country would be able to implement mitigation actions jointly that would be considered in the context of the same accounting framework.

Although a deeper analysis would be needed to further explore this option, it is likely that mitigation outcomes being transferred within the same accounting framework would not need corresponding adjustments (although the cooperating countries still need to track the flows of emission reductions and ITMOs in order to ascertain whether their respective allocated targets have been reached). The bilateral agreement between the cooperating countries would establish how emissions reductions are allocated between the two countries. The bilateral arrangement could also provide for legal consequences for a Party that does not achieve its allocated target.

5.3. Applying corresponding adjustments

Article 6.2 requires robust accounting to avoid double counting in the event of international transfers of mitigation outcomes. According to Decision 1/CP.21, avoidance is ensured through corresponding adjustments made by Parties for emissions by sources and removals by sinks outlined in their NDCs.¹³⁵ In a similar manner, Article 6.5 prohibits a host country to use Article 6 emission reductions to demonstrate the achievement of its NDC, if these are used by another party to demonstrate achievement of the other party's NDC. The provisions avoid the possibility that a reduction or removal may be double claimed by both countries.¹³⁶

Parties to the Paris Agreement are currently negotiating how and when to apply corresponding adjustments in relation to Article 6.2 approaches and the Article 6.4 Mechanism, including possible situations in which corresponding adjustments may not be needed. Although the informal notes are expected to evolve and be modified substantially in the run-up to COP24, elements contained in these notes already provide a number of relevant indications to answer these questions:

- **How.** Methods for ensuring corresponding adjustments include: (i) emission-level adjustments, where the GHG inventory is the starting point for the calculations;¹³⁷ and (ii) adjustments made into a budget-based system, where NDCs are converted into emission

¹³⁵ UNFCCC (2015) The Paris Agreement, Article 6.2; Decision 1/CP.21, Paragraph 36.

¹³⁶ Climate Focus, Koru Climate and Perspectives (2017) [Features and implications of NDCs for Carbon Markets](#).

¹³⁷ From the emissions perspective, adjustments made would not affect the inventory as this is a record of the country's actual emissions and must stay unchanged. Rather, to arrive at "accounted emissions", adjustments would have to be shown in parallel tables as an "inventory emissions" adjustment. See Climate Focus, Koru Climate and Perspectives (2017) [Features and implications of NDCs for Carbon Markets](#).

budgets. There are also options being discussed in relation to the possible use of a buffer registry to count for transfers.

- **When.** Four particular alternatives appear to stand-out for when to make corresponding adjustments: (i) at the moment of creation or issuance of ITMOs; (ii) at the moment of acquisition by a recipient country; (iii) at the time of submitting information as per Article 13.7; and (iv) at the moment of use of the ITMO against the NDC by a recipient country;
- **Whether.** In exceptional circumstances, corresponding adjustments may not be required. One example would be when ITMOs or emission reductions fall outside the scope of the NDC or are merely used for climate finance and attribution purposes.

With respect to methods, it seems unlikely at this point that the CMA will require (in a top-down manner) that countries adopt a single method for applying corresponding adjustments. Peru may thus have the option to choose between an emissions-based or a budget-based approach. This may also be subject to negotiations between Peru and partner countries engaging in bilateral or plurilateral cooperative arrangements.

While the emissions level and the budget-based approach are mathematically similar, with both being able to meet the requirement of no increase in aggregate emissions as a result of the ITMO,¹³⁸ countries may have different preferences. Peru may for instance, seek assistance from a partner country to set up and operate a fully-fledged registry system, in exchange for adopting a budget-based approach where the country's (or the relevant sectoral) target is first converted into an emissions budget and then into serialised electronic units.

Regarding the moment in which corresponding adjustments are made, any transaction by Peru and a partner country or another international buyer would have to in this respect be flexible enough to accommodate emerging CMA guidance. This said, there seems to be advantages for opting to undertake accounting adjustments at the moment ITMOs are transferred out of Peru. This could ensure clarity and predictability for partner countries and international buyers, as well as to the international community scrutinizing cooperative approaches, and thus better position Peru as a reliable supplier of ITMOs.

Conversely, effecting a corresponding adjustment at the moment of creation and issuance of an ITMO might be too soon (as the mitigation outcome may remain with Peru, rather than being transferred out). In turn, applying a corresponding adjustment at the moment of use by a recipient country would make the exact timing of use and the need for the accounting adjustment very unclear to the contracting parties. Peru would likely have incomplete information about the final use of ITMOs (in particular in the event of a long chain of transfers).¹³⁹

¹³⁸ It is not necessary for all countries to adopt implement the same method or for both countries using an ITMO to adopt the same method, or finally, that a country uses only one method. A country could adjust the emissions side for G2G transfers while it adjusts emission budgets for a crediting programme. See Climate Focus, *Koru Climate and Perspectives (2017) Features and implications of NDCs for Carbon Markets*.

¹³⁹ Marcu, A., and Zaman, P. (2018) *'Straw Man': Guidance on Cooperative Approaches Referred to in Article 6, Paragraph 2 of the Paris Agreement*. International Center for Trade and Sustainable Development.

From a market and transaction perspective, it might also be more advantageous to establish a transparent (publicly available) and timely procedure for applying corresponding adjustments at the moment ITMOs are transferred. Often, partners and investors will prefer engaging with systems that offer clear and predictable rules (even when these include a particular tax or levy on transactions), to deal with uncertain regulations, largely informal procedures and the risk of constant changes to the rules. Buyers under CORSIA would be a case point, where aircraft operators would likely be more attracted to offset suppliers that can clearly and timely secure corresponding adjustments upon the transfer of the emission reductions.

Applying a corresponding adjustment at the moment of transfer will also attract those investors which are concerned with ensuring the environmental integrity of cooperative approaches. Possible partners (countries, non-governmental entities and impact investors) willing to achieve an overall mitigation in emissions, could be interested in cancelling acquired ITMOs and would be attracted by the fact that Peru would secure a corresponding adjustment immediately upon transfer, regardless of how and when an ITMO is eventually used.

There are also instances where corresponding adjustments might not be necessary when emission reductions do not count towards a country's NDC. More specifically, from the side of the transferring country, adjustments may be deemed unnecessary if mitigation outcomes are outside the scope of the NDC or when outcomes are not accounted for by the acquiring country towards its NDC.¹⁴⁰ Corresponding adjustments are also not needed in the context of results-based climate finance (without the transfer of title to emission reductions).¹⁴¹

5.4. Accommodating private sector participation and investments

Creating incentives for the participation of the private sector in the Peruvian solid waste sector is critical to ensure the long-term sustainability of any investments made and their respective emission reductions. Public sector funding (domestic and international) alone will not be enough. Furthermore, Peru has also stated in its NDC that it does not intend to increase public sector debt as a result of its engagement in cooperative approaches and new market mechanisms.

There are different ways in which the private sector can be accommodated, including options where private entities are directly credited for their mitigation activities (either internationally or domestically) and those in which the private sector is incentivized through non-crediting instruments, such as grants, soft loans and guarantees. Combinations of these alternatives are also possible.

¹⁴⁰ Schneider, L., Broekhoff, D., Cames, M., Füssler, J., & La Hoz Theuer, S. (2016) [Robust Accounting of International Transfers under Article 6 of the Paris Agreement – Preliminary Findings](#): Discussion Paper. German Emissions Trading Authority (DEHSt) at the German Environment Agency.

¹⁴¹ Schneider, L., Broekhoff, D., Cames, M., Füssler, J., & La Hoz Theuer, S. (2016) [Robust Accounting of International Transfers under Article 6 of the Paris Agreement – Preliminary Findings](#): Discussion Paper. German Emissions Trading Authority (DEHSt) at the German Environment Agency.

Direct crediting of private sector entities

Allowing the private sector to own and directly engage in the sale of emission reductions at the international level could encourage further private sector investment. The Article 6.4 Mechanism will likely be the main international regulatory route for private sector participants to become involved via direct international crediting. This option could be loosely modelled after the CDM and JI Track 2 mechanisms, where validation and verification of mitigation activities take place through internationally accredited auditors. Article 6.4 units would directly be issued into private sector participants' electronic accounts, which would be allowed to trade these at the domestic or international level.

Another possibility for Peru is to establish a system for the domestic crediting of mitigation activities. This option could be modelled after JI Track 1 – and/or after more recent approaches being currently tested, such as the World Bank's Carbon Initiative for Development (Ci-Dev) – and could potentially fit under Article 6.2 or Article 6.4 of the Paris Agreement. Mitigation activities would be validated and verified by either nationally or internationally accredited auditors. Units issued by Peru and transferred internationally would be matched with a corresponding adjustment to Peru's carbon budget or national GHG inventory.

To safeguard Peru's own NDC achievement and the overall environmental integrity of cooperative approaches under Article 6, the options above would require swift, transparent and predictable procedures for authorizing and approving mitigation activities at the domestic level. A formal domestic regulation detailing how the authorization of mitigation activities would be performed, including timelines for approval, the need for periodic adjustments to activity baseline and additionality (pursuant to new NDC cycles), third-party verification, authorization to trade units internationally (as ITMOs or Article 6.4 units) and, in particular, the moment in which accounting adjustments would be applied by Peru, would send a clear and positive signal for the international community and potential investors.

Good governance, strong institutions, and publicly available information are also paramount. While legal and administrative procedures can build on the current domestic institutional arrangements established for approving and authorizing CDM projects and the NRMA in Peru, they would likely need to be further enhanced and detailed in order to fulfil a number of additional domestic regulatory functions. That said, the international crediting option (through the Article 6.4 Mechanism) may be a faster and clearer route for the Peruvian private sector, as most of the infrastructure needed would be made available in a centralized manner. The domestic crediting alternative, in turn, would clearly require a stronger set of institutions and probably a full-fledged domestic registry system.

Use of a single entity for managing crediting

Another option to leverage additional private investments for the Peruvian solid waste sector is to consolidate it into a single (e.g. public-private) financing entity, the function of managing all climate-related funds, as well as marketing/selling emission reductions internationally. This umbrella

financing entity could thus act as the interface between international climate financiers and the domestic private sector.

A NAMA revolving fund as proposed in the Solid Waste Sector NAMA Proposal would be an interesting alternative to further develop and build on. This entity could become responsible for receiving, managing and disbursing international (and possibly also domestic public) climate finance through a variety of financing instruments. It would therefore co-finance a large portfolio of solid waste sector projects willing to tap into climate finance and carbon market opportunities.

Under this option, private waste sector entities willing to join could assign their rights to existing and future emission reductions to the umbrella financing entity in exchange for financial support in the form of soft loans and small grants. This umbrella public-private financing entity would then be able to develop optimal climate and carbon finance strategies, tapping into multilateral and bilateral climate finance opportunities, as well as into the Article 6 market-based approaches.

This public-private financing entity would be able to negotiate with each partner country or financier the portion of domestic and international finance to be used in a given portfolio of projects and how emission reductions would be shared. Those attributed to domestic and international climate finance could be retained and used by Peru in over-achieving its NDC, whereas those attributed international carbon markets (e.g. Articles 6.2 and 6.4, and CORSIA) could be converted into ITMOs and transferred out of the country.

Finally, this public-private financing entity could also become responsible for directly coordinating with Peruvian domestic institutions to ensure corresponding adjustments are applied in a timely and transparent manner, and units are issued, transferred and/or cancelled with the domestic registry system (once this is up and running).

For international buyers and financiers, this could be perceived as a more cost-effective, streamlined and transparent way of providing climate finance and transacting emission reductions. For Peru, climate and carbon finance strategies for the solid waste sector could become fully aligned with the country's goals and interests when engaging with international carbon markets. For local landfill operators, this could also be interesting to the extent that they would only or mostly be concerned with their core business and leave the monetization of carbon credits to another entity. This option, however, should exclude the possibility of direct crediting for those landfill operators willing to retain their GHG rights and engage directly with international buyers and financiers.

6. Pilot Cooperative Arrangement

In this section we propose a Pilot Cooperative Arrangement between Peru and a partner country for the transfer of ITMOs from the Peruvian Solid Waste Sector NAMA (SWS NAMA) and outline how the main aspects of the transaction could be operationalized. If and once agreed between Peru and a possible partner country (Partner Country), these suggestions could be fully or partially incorporated in a Mitigation Outcome Purchase Agreement (MOPA) to be entered between Peru and the partner country.

This final section is structured as follows: Section 6.1 describes the general approach to the cooperation and the premises upon which the suggested Pilot Cooperation Arrangement is built. Section 6.2 provides an overview of the transaction structure proposed for the Pilot Cooperative Arrangement. Sections 6.3 to 6.8 describe in more detail the following key aspects of the transaction: ITMO generation and pre-conditions to transfer (Section 6.3); ITMO delivery and market transfer-route (Section 6.4); emissions reduction sharing arrangement between the cooperating countries (Section 6.5); moment and method of executing corresponding adjustments (Section 6.6); and disbursement and use of the upfront finance (Sections 6.7 and 6.8). Section 6.9 suggests possible next steps.

The suggested Pilot Cooperative Arrangement does not attempt to cover all aspects needing resolution between cooperating countries in an ITMO transfer. Instead, it suggests only one possible arrangement and structure that could accommodate, in a simplified, transparent, and pragmatic manner, Peru's domestic priorities, the nascent rules under Article 6 and the other provisions of the Paris rulebook, while remaining attractive enough for a partner country and other potential buyers to invest in Peru's solid waste sector.

While this section mostly focuses on a possible transaction between two countries (i.e. a government-to-government transaction), boxes are used to provide some additional insights and alternatives for the transaction structure, including on possible adjustments to further attract the interest of international private-sector buyers and financiers. However, it lies beyond the scope of the present analysis to suggest specific ITMO-transfer volumes or payment sums between the cooperating countries.

6.1 Basic premises and assumptions

Peru is currently setting-up national accounting and reporting arrangements that are expected to be consistent with the TACCC¹⁴² principles set out in Article 4.13 of the Paris Agreement. The Infocarbono, along with the NRMA and the SIGERSOL are expected to enable the tracking of progress in achieving the country's NDC and underpin the necessary quality checks of mitigation outcomes eventually produced by the SWS NAMA.¹⁴³

¹⁴² Transparency, Accuracy, Completeness, Comparability and Consistency (TACCC). See Article 4.13 of the Paris Agreement.

¹⁴³ In particular, ensuring that SWS NAMA activities credited are real, additional, long-term, measurable, and independently verified.

At the same time, while Peru has clearly advanced on its market readiness with the support received from the NPI, PMR, JICA, BID, GEF – among other bilateral and multilateral donors – the country is not yet at the stage in which it could consider more elaborated and institutionally demanding carbon-market approaches, such as a linked cap-and-trade system. The suggested Pilot Cooperative Arrangement, therefore, takes the form of a government-to-government transaction between Peru and a potential Partner Country and seeks to complement the market-readiness efforts currently on-going in the country.

The envisaged Pilot Cooperative Arrangement covers aspects related to the generation of ITMOs from the SWS NAMA as well as their transfer to a Partner Country, anticipating, but also hopefully informing, emerging CMA guidance on Article 6's market-based approaches. In contrast to suggesting a mere off-take (sale and purchase) of ITMOs, the Pilot Cooperative Arrangement considers the provision of upfront support to Peru to refine its national and sectoral MRV system and to further engage the private sector in financing and implementing the necessary actions in the Peruvian solid waste sector. Upfront resources would be disbursed in successive tranches and be output-based, that is, conditioned on the achievement of certain pre-agreed milestones by Peru ("Pre-Agreed Payment Milestones").

The Pilot Cooperative Arrangement also follows certain features of existing Article 6 pilot initiatives – such as the World Bank's Ci-Dev Rural Electrification Program in Senegal – in that it is instrument neutral and allows for the cooperating countries to eventually choose the optimal ITMO-transfer route. Peru and the Partner Country would, therefore, have the flexibility to pursue the registration (and, if applicable, CDM transition) of eligible SWS NAMA activities under the Article 6.4 Mechanism, or alternatively to follow a more decentralized approach under Article 6.2 cooperative approaches (once the Peruvian domestic and sectoral MRV system is complete).

Regardless of the international market-route selected (Article 6.4 or 6.2), as emissions from activities in the solid waste sector in Peru are fully covered by the country's NDC, all ITMOs derived from the SWS NAMA and eventually transferred would require an accounting adjustment by Peru to avoid double counting. These ITMO-transfers would be transparently and coherently reported by both Peru and the Partner Country pursuant to paragraph 107 of the Paris Decision and possible emerging guidance under the transparency framework.

The aspects and alternatives discussed below are largely dependent on the final guidance, as well as modalities and procedures eventually agreed by Parties under the Paris Agreement (hereinafter referred to as "International Rules"). To the extent possible, suggestions are formulated in a flexible manner and could be adjusted by the cooperating countries to remain consistent with the International Rules.

6.2 Transaction structure

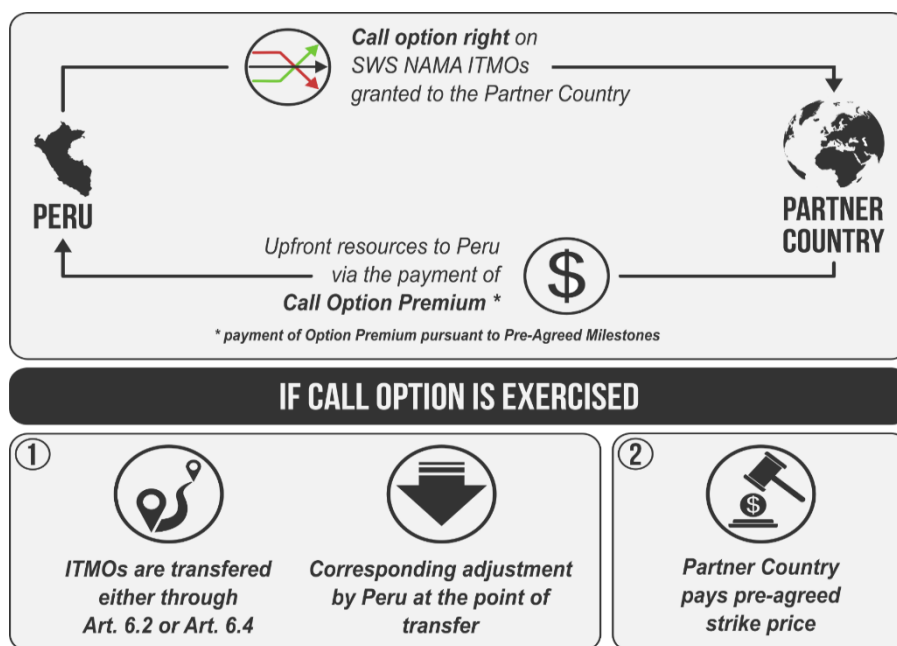
As discussed in Section 5 above, there are several different ways in which an Article 6-cooperative approach may be structured. For the Pilot Cooperative Arrangement, we suggest a call option structure in which the Partner Country has the right, but not the obligation, to purchase ITMOs from the SWS NAMA at an agreed future date and unit strike price (Option ITMOs).

In exchange for the right granted by Peru to the Partner Country, the Partner Country agrees to pay a Call Option Premium, to be disbursed in tranches in accordance with Pre-Agreed Payment Milestones that will need to be met by Peru. The Pre-Agreed Payment Milestones would be tailored and sequenced to support Peru in its on-going market readiness efforts and to roll-out the SWS NAMA.

The exercise of the Call Option Right by the Partner Country, however, would be pre-conditioned on: (i) Peru being on track to over-achieve its NDC; and (ii) ITMOs being generated by the SWS NAMA. These pre-conditions to transfer are suggested to mitigate the risk that Peru over-commits to sell ITMOs the country will eventually need for meeting its own NDC. It also ensures that ITMOs sold are directly linked to mitigation outcomes from the SWS NAMA.

The suggested Pilot Cooperative Arrangement could encompass the first two NDC cycles under the Paris Agreement (2021-2025 and 2026-2030). Figure 4 provides a simplified illustration of the proposed Pilot Cooperative Arrangement.

Figure 4 – Proposed Pilot Cooperative Arrangement



For Peru, the use of a conditional call option is suggested here for the following potential advantages:

- Possibility to receive a substantial upfront payment through the Call Option Premium to assist the country in its preparedness to account for its NDC and report information under the transparency framework;
- Depending on the sum agreed for the Call Option Premium, upfront payments may also help unlock private sector investments in the Peruvian solid waste sector and accelerate the implementation of project activities within the SWS NAMA;
- No firm ITMO-delivery obligation or penalty payments for under-delivery would apply to Peru in this potential transaction and Peru

would only commit to undertake its best efforts to produce Option ITMOs and to remain on track to over-achieve its NDC. The call option premium disbursed by the Partner Country would not need to be repaid by Peru in case ITMOs are not produced (despite Peru's best efforts);

- The cooperating countries would limit the exercise of Call Options to specific 'call option exercise periods' and to pre-agreed maximum volume of ITMOs which could be purchased. If the Call Option is not exercised by the Partner Country within the relevant Call Option Exercise Periods, Peru may use or sell the respective Option ITMOs to another partner country or international investor;
- The Call Option structure may attract the interest of partner countries not yet willing to commit to a firm purchase agreement (at least before having greater clarity of the quality of ITMOs being produced by Peru and on the ambition of Peruvian NDC targets). At the same time, the conditionality of ITMO-transfers mitigates risks associated with Peru's capacity to achieve its own NDC.

In turn, for the Partner Country, the suggested arrangement could remain attractive to the extent that the Pilot Country would: (i) obtain a first rank right over ITMOs from the SWS NAMA, hedging for future NDC-achievement costs and gaining additional flexibility to manage the country's emission reductions; and (ii) avoid a firm purchase commitment, preventing the long-term lock-in of domestic public budget and securing it only purchases ITMOs which are deemed environmentally robust.

Therefore, through the Call Option, the Partner Country would be given priority in relation to any other possible buyers or investors in the SWS NAMA. The disbursement of the Call Option Premium would be structured through successive tranches and in accordance with specific outputs to be achieved by Peru. The possibility of a payment of a high strike price upon delivery of ITMOs would also create additional incentives for Peru to produce quality ITMOs and over-achieve its NDC (ensuring an efficient use of public resources). In addition, if the Partner Country opts not to use exercised Option ITMOs to (over-) achieve its own NDC, these ITMOs could be eventually cancelled to deliver an overall mitigation in global emissions.

However, there are also disadvantages with the use of a Call Option structure for the Pilot Cooperative Arrangement. For Peru, in particular, this structure would reduce certainty about the precise revenue inflows from ITMOs. On the other hand, the revenue predictability problem can be mitigated if the value of Call Option Premium represents a substantial portion of the total payment to be made by the Partner Country.

Table 12 below provides a summary of the main elements of the suggested Pilot Cooperative Arrangement. Commercial aspects are left between brackets and would have to be further and carefully negotiated by the cooperating countries. From the perspective of Peru, an ITMO transaction will only be successful if it helps in ensuring the provision of additional and adequate revenue streams to the country. For the Partner Country, in turn, payments disbursed and the price paid for each ITMO will, to some extent, reflect the risk-profile of the transaction. In the end, it is crucial that the commercial aspects be tailored so as to ensure both countries have the incentive to continue cooperating in the medium- to long-term.

Table 12 – Main elements of the Pilot Cooperative Arrangement

Type of transaction:	Call Option, with ITMO-transfers subject to Conditions Precedent and payment of the Call Option Premium subject to Pre-Agreed Payment Milestones.
Mitigation intervention:	Solid Waste Sector NAMA (SWS NAMA). The exact activities that comprise the SWS NAMA will be identified jointly by Peru and the Partner Country and clearly defined in the MOPA.
Option ITMOs:	[Pre-defined maximum volume of] Option ITMOs, each Option ITMO being expressed as a tonne of carbon dioxide equivalent that: (i) is generated from the SWS NAMA; and (ii) corresponds to emission reductions achieved beyond the NDC pledge.
NDC Cycles:	The Pilot Cooperative Arrangement covers a minimum of two NDC Cycles. The first NDC cycle runs from 2021-2025 (“NDC Cycle (1)”). The second NDC Cycle runs from 2026 to 2030 (“NDC Cycle (2)”). The cooperating countries may agree to extend the Call Option to additional NDC cycles.
Call Option Premium:	In exchange for the Call Option right granted by Peru, the Partner Country agrees to pay Peru a Call Option Premium in the total amount of [value in EUR]. The Call Option Premium is paid in [number of instalments] pursuant to an agreed tranche payment schedule and once each relevant Pre-Agreed Payment Milestone has been met.
Call Option Exercise:	Subject to the applicable Conditions Precedent to the transfer of ITMOs, the Partner Country may exercise the Call Option in respect to all or part of the Option ITMOs within each pre-agreed Call Option Exercise Periods.
Delivery and Transfer Route:	<p>Once a Call Option is exercised by the Partner Country – and provided the Conditions Precedent applicable to the transfer of ITMOs are met – Peru will transfer Option ITMOs to the Partner Country, and the Partner Country will pay the agreed strike price for each delivered Option ITMO (“Strike Price”). Option ITMOs can be delivered to the Partner Country:</p> <ul style="list-style-type: none"> ▪ In the form of Article 6.4 Units through Article 6.4’s centralized international transaction log; or ▪ In the form of Article 6.2 ITMOs, which can be expressed as electronic serialised units or in amounts or volume of verified ERs, as agreed in the MOPA. <p>At the beginning of each NDC Cycle, the cooperating countries will jointly agree on the most appropriate market transfer-route to be used in the event a Call Option is exercised.</p>
ITMO Strike Price:	For each Option ITMO for which the Call Option has been exercised by the Partner Country and delivered by Peru, the Partner Country agrees to pay [EUR value] within [number of days] of the Delivery Date.

Box 2 – Reducing risks for international private sector buyers

Private-sector buyers may be reluctant to provide a substantial portion of upfront payments, in particular where there are no firm-delivery obligations (i.e. penalty payments) imposed on the seller for under-delivery. Alternatives to circumvent this problem and further attract other types of international buyers include, for instance setting aside specific projects from which emission reductions would be converted into ITMOs and transferred to the buyer in any case. That is to say, for this particular set-aside, the conditions precedent to the transfer of ITMOs would thus not apply.

Another option to reduce risks for international buyers could be that only a portion of the upfront payments be deemed the call option premium, with the remainder being disbursed as a concessional loan, to be repaid in ITMOs (if any) and/or cash, in accordance with the pre-agreed terms and conditions specified in the MOPA.

6.3 ITMO generation and pre-conditions to transfer

The exercise of the Call Option granted by Peru to the Partner Country would be conditioned on: (i) Peru being on track to over-achieve its NDC; and (ii) the generation of ITMOs from the SWS NAMA (“Conditions Precedent”). This means that if (and only if) the Peruvian NDC is on course to over-achieve e.g. the unconditional component of its NDC and emission reductions from the SWS NAMA are produced beyond a SWS crediting baseline, the Partner Country would have the right to exercise the Call Option.

Note that these Condition Precedents would apply to the exercise of the Call Option by the Partner Country. They do not affect the payment of the Call Option Premium, which would be disbursed in successive tranches and in accordance with Pre-Agreed Payment Milestones that would need to be met by Peru (see Section 6.7 below).

Tracking progress in achieving the NDC

To assess performance in relation to Peru’s progress in implementing and achieving the country’s NDC, Peru and the Partner Country could agree to establish a multi-year emissions trajectory for each NDC Cycle. This multi-year trajectory would serve as an indicative (non-binding) accounting reference for the cooperating countries to measure Peru’s overall performance in exceeding its NDC pledge (“Non-Binding Multi-Year Trajectory”). It would thus become an accounting benchmark valid at bilateral/contracting level only. Peru would thus not be required under the proposed Pilot Cooperative Arrangement to communicate a new NDC containing a multi-year target.

To avoid an excessive reporting burden on Peru, the assessment of progress in over-achieving the NDC would take place concomitantly with Peru’s reporting obligations under the Paris Agreement’s Enhanced Transparency Framework. For each of Peru’s submitted biennial transparency reports and its national GHG inventory, the cooperating

countries would obtain a snapshot of Peru's progress and determine whether the country has managed to exceed its Non-Binding Multi-Year Trajectory.

Box 3 – NDC-achievement risk and alternative conditions precedent

International private sector buyers (and possibly many buyer countries) are unlikely to be willing to shoulder the NDC-achievement risk of host countries alone. Conditions precedent which condition the transfer of ITMOs to the host country being on track to over-achieve the entire NDC is therefore unlikely to be realistic or acceptable in a number of instances, in particular where the sector from which ITMOs are generated correspond to a relatively small part of the total emissions of the country.

An alternative for Peru in this case would be to limit the conditions precedent to the performance of the Peruvian solid waste sector only, as opposed to the performance of all NDC-covered sectors. This option would increase risks of ITMO over-selling for Peru but decrease risks for international investors seeking to finance and purchase ITMOs from a portfolio of projects in the solid waste sector. It could therefore lead to greater interest from international buyers.

Peru may also opt, in certain limited cases and transactions, to guarantee the delivery of contract ITMOs by sourcing replacement emission reductions from projects and activities that are outside the SWS NAMA (and which are deemed by the buyer as being of the same quality and nature, and acceptable as replacement ITMOs).

Generation of ITMOs from the SWS NAMA

To estimate the generation of emission reductions or ITMOs, the Pilot Cooperative Arrangement could define a solid waste sector crediting baseline that reflects e.g. the unconditional pledge in the Peruvian NDC (the "SWS Crediting Baseline"). Using the NDC unconditional pledge as a basis for the development of the SWS Crediting Baseline ensures alignment between national and sectoral action and mitigates the own-NDC achievement risk for Peru.¹⁴⁴ Alternatively, Peru and the Partner Country may also opt to derive the SWS Crediting Baseline from both the unconditional and conditional NDC pledge, removing completely the risk for Peru of transferring ITMOs that the country may need in the future.

Note that the suggested SWS Crediting Baseline would provide an *ex-ante* sectoral reference level for the potential amount of ITMOs to be produced. Crediting, however, would only occur *ex-post*.

Peru could agree to revise or amend its NDC implementation plan to clearly set out how the country intends the activities of the SWS NAMA to contribute to the NDC. To further clarify which are the emission reductions available for sale and transfer, the future MOPA could also define

¹⁴⁴ Partnership for Market Readiness (PMR) 2017. Establishing Scaled-up Crediting Program Baselines under the Paris Agreement: Issues and Options. World Bank.

'Contracted ITMOs' as those emission reductions directly stemming from the solid waste sector (i.e. from the Solid Waste Sector NAMA or a set of pre-agreed interventions) and generated over and above the SWS Crediting Baseline.

The cooperating countries could agree on the steps to establish the SWS Crediting Baseline. This includes distinguishing between measures which Peru would implement without resorting to international crediting¹⁴⁵ and those SWS NAMA activities that would serve as a basis for the generation of ITMOs. It would also include agreeing on the commissioning of a third-party reviewer of the SWS Crediting Baseline. The construction of the SWS Crediting Baseline, coupled with a periodic independent third-party review, could also feature as one of the Pre-Agreed Payment Milestones for disbursing one of the tranches of the Call Option Premium.

Box 4 – Working with a pilot project with the SWS NAMA

While this study builds on the SWS NAMA as an upscaled mitigation program, Peru and certain international buyers may also opt to engage initially with only one or two specific projects, which may be used as pilots for future transactions. For these cases, a SWS Crediting Baseline would not be necessary. Instead, project-specific baselines and additionality assessment could be applied, bearing in mind the possible need to reflect the NDC pledge in the construction (or review) of the baseline.

As mentioned before (Box 2), if the selected pilot activities are expected to lead to a relatively small number of ITMOs, it may also be possible that Peru agrees to guarantee the sale and transfer of these without any restrictions or condition precedent. This could potentially entitle the country to negotiate a better unit price for each ITMO sold.

Exercise of the Call Option rights by Partner Country

Under the Pilot Cooperative Arrangement and, in future, in the Mitigation Outcome Purchase Agreement (MOPA), the cooperating countries could agree to a Maximum Volume of Option ITMOs for each NDC cycle. This could be agreed by the countries at the beginning of each NDC Cycle and would ensure that Peru has the flexibility to manage (i.e. sell to a third party or use for its own NDC achievement) ITMOs generated above and beyond the agreed maximum volume per NDC cycle. In the MOPA, a provision could be established to state that Peru shall have no obligation to offer, and the Partner Country shall have no obligation to purchase, Option ITMOs in excess of the Maximum Volume of Option ITMOs generated in any given NDC Cycle.

In addition to the Maximum Volume of Option ITMOs per NDC cycle, the cooperating countries could clearly define the number of times and the

¹⁴⁵ See Spalding-Fecher, Randall (2017) Pilot Activities on Article 6.2 of the Paris Agreement. Carbon Limits; Howard, A., Chagas, T., Hoogzaad, J., & Hoch, S. (2017). Features and Implications of NDCs for Carbon Markets, in: Swedish Energy Agency (2017). Reports on international cooperation for climate change mitigation; and Partnership for Market Readiness (PMR) 2017. Establishing Scaled-up Crediting Program Baselines under the Paris Agreement: Issues and Options. World Bank.

periods within which the Call Option could be exercised by the Partner Country. This would provide further clarity in relation to the number of transfers of ITMOs taking place under the Pilot Cooperative Arrangement.

As an illustration, the cooperating countries could agree to two or three specific Call Option Exercise Periods in which the Call Option could be exercised by the Partner Country. The first Call Option Exercise Period could fall towards the end of NDC Cycle (1), and the other two Call Option Exercise Periods throughout NDC Cycle (2). The Partner Country would have to notify Peru beforehand (e.g. with 6 to 12 months in advance of each Call Option Exercise Period) whether it intends to exercise the respective Call Option right.

In the event that the Partner Country does not notify Peru of its intention to exercise a Call Option right, that particular Call Option right would lapse and Peru would be able to retain or sell to a third-party these specific Option ITMOs. Contractual provisions could be established in the MOPA to ensure that:

- The Partner Country may exercise the Call Option in respect of all or part of Option ITMOs produced by the SWS NAMA by providing Peru with a duly completed Call Option Notice at any time during the Call Option Exercise Period for such Option ITMOs; and that
- Peru may use towards its own NDC or sell to any third party any Option ITMOs in respect of which the Partner Country has not exercised the Call Option on or by the expiry of the Call Option Exercise Period for such Option ITMOs, provided that any such sale arrangements do not prejudice the rights of the Partner Country under the MOPA.

Box 5 – Number of times a call option can be exercised

In order to safeguard the interests of Peru, the Pilot Cooperative Arrangement has suggested only a few limited instances in which the call option could be exercised by the Partner Country: one towards the end of the first NDC cycle, and twice during the second NDC Cycle (when presumably Peru would already have acquired greater capacity to manage its emissions and emissions reductions).

However, the call option exercise periods agreed by the contracting parties could potentially be set at more regular intervals, e.g. annually or biennially. This may be more attractive for certain buyers willing to obtain (and possibly forward sell) ITMOs more frequently. For instance, in a situation where the condition precedent to the transfer of ITMOs is limited to the performance of the solid waste sector (as opposed to the progress seen in all NDC-covered sectors), annual SWS information made available by the latest SIGERSOL version could suffice to give Peru and the buyer an adequate snapshot of GHG emissions from the sector for each year. This would give clarity on how emissions from activities covered by the SWS NAMA are trending and whether Peru would be able to convert emission reductions into Option ITMOs.

6.4 ITMO delivery and transfer-route

Actual emission reductions leading to ITMOs would be measured, reported and verified independently. To allow for further flexibility for the cooperating countries, the MRV process of the SWS NAMA (or for the jointly pre-defined activities) could be conducted either through the centralized process offered by the Article 6.4 Mechanism or through a rigorous domestic process of monitoring, reporting, verification to be established by Peru on the basis of the NRMA, the Inforcarbono, and a possible domestic electronic registry system (following the emerging Article 6.2 guidance).

The use of either the Article 6.4 centralized MRV process or, alternatively, of a sound domestic MRV system is necessary to secure the quality of ITMOs being produced by the SWS NAMA. One option for Peru and the Partner Country would be to make use of the Article 6.4 Mechanism during the first NDC cycle and – in parallel – continue on-going MRV readiness work so that the country can opt for the Article 6.2 track during the second NDC cycle.

The use of Article 6.4 could ensure the environmental integrity of ITMOs produced by the selected activities of the SWS NAMA during the initial years of the Pilot Cooperative Arrangement, while Peru builds further domestic institutional and technical capacity (including via the use of resources from the Call Option Premium).

Peru would use the Call Option Premium to continue its current efforts to refine its national domestic system (e.g. data collection and processing, QC/QA procedures), develop its electronic registry system, and a domestic approval process that ensures emission reductions are additional, real, measurable, long-term and independently verified. This solid domestic MRV system is needed not only to ensure environmental integrity of ITMOs produced by the SWS NAMA (MRV of mitigation actions), but also to secure that these ITMOs are fully captured by Peru's periodic national emissions inventory (MRV of GHG emissions).

Once the domestic MRV process in Peru is up and running, the cooperating countries could progress to an Article 6.2 ITMO transfer-route under the Pilot Cooperative Approach (always pursuant to the guidance issued by the CMA). This has the potential for reducing transaction costs and the lead-time for the generation of ITMOs, providing for a simpler and more efficient approval cycle process for activities within the SWS NAMA. For instance, validation and verification could occur at the same time, with verification functions being supported by clear and transparent domestic guidelines.

If and when the Article 6.4 route is chosen, delivery of Option ITMOs could take place through the centralized registry and transaction log functioning under the Article 6.4 Mechanism. When the Article 6.2 route is selected by the cooperating countries (and depending on the final guidance emerging from the CMA), delivery of Option ITMOs could take place in the form of serialized units transferred electronically, e.g. through integrated (peer-to-peer) registries. Alternatively, if Peru does not wish to develop a full-fledge national registry system, the cooperating countries could agree to transfer ITMOs in the form of verified tonnes of CO_{2e} reduced. Option ITMOs transferred would then be reported transparently, periodically, and consistently by both countries in accordance with modalities that will emerge under paragraphs 107 of the Paris Decision and Article 13.7(b) of the Paris Agreement.

6.5 Emission reductions sharing arrangement

A future MOPA must also clearly define the emissions reduction sharing arrangement between the cooperating countries. Peru and the Partner Country can specify which portion of the emission reductions are to be retained by Peru and accounted for its unconditional or conditional pledges, and which portion may be transferred to the Partner Country as Option ITMOs.

The Pilot Cooperative Arrangement also suggests that the cooperating countries set-aside a portion of the emission reductions that would be cancelled and not accounted for by any of the transacting parties (thus leading to a degree of overall mitigation that goes beyond offsetting).

Emission reductions sharing arrangement

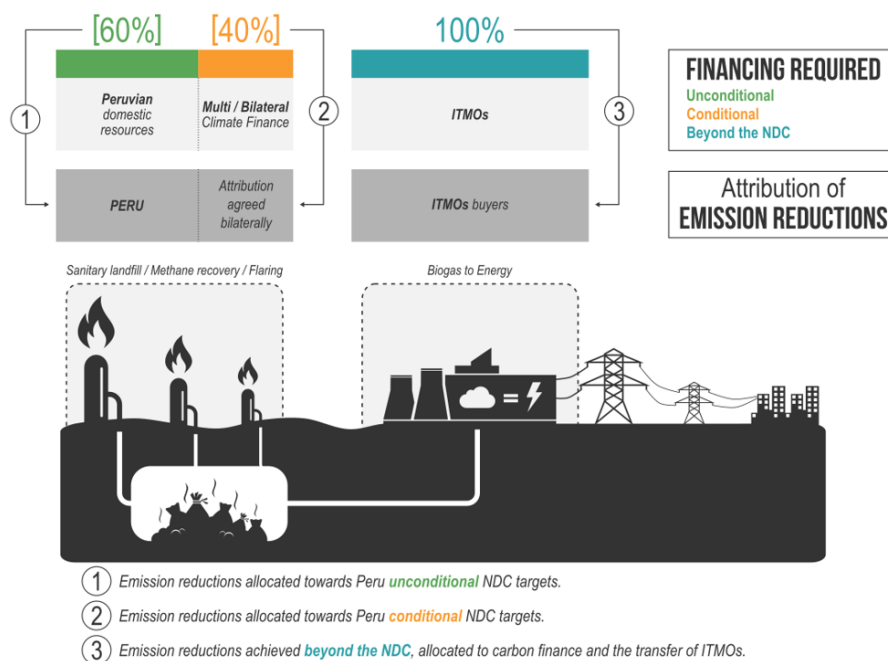
One potential and pragmatic option to allocate and share mitigation outcomes could be to distinguish emission reductions per technological component of the SWS NAMA or jointly pre-defined mitigation activities. For instance, emissions reductions stemming from the implementation of sanitary landfills with methane recovery and flaring could be attributed to Peru, whereas those emission reductions deriving from the use of biogas to produce energy could be attributed to the Partner Country.

If this option is pursued, Peru could specify the activities of the first technological component (sanitary landfill with methane recovery) that are to be financed and implemented as part of the unconditional and/or conditional part of NDC; and the activities of the second technological component (energy generation) that would represent a mitigation effort beyond current NDC efforts and to be tapped via the use of international market mechanisms.

In this hypothetical case, only those emission reductions from energy generation would be deemed Option ITMOs and thus subject to the Call Option right granted by Peru to the Partner Country. All other emission reductions would be retained by Peru and accounted for the country's NDC unconditional or conditional pledge in accordance with the clarifications provided by Peru on how it foresees the SWS NAMA assisting the country in achieving its NDC (Figure 5).

The different layers of international climate finance flowing to the solid waste sector in the Peru and the SWS NAMA would have to be clarified by Peru via bilateral agreements with existing bilateral and multilateral financiers and donors. We suggest that obtaining these agreements with international agencies on the attribution of the different layers of international climate finance is established as Pre-Agreed Payment Milestone (see Table 13, Section 6.7 below).

Figure 5 – Attribution of support and sharing of emission reductions



Overall mitigation in global emissions

In addition to the emissions reductions sharing arrangement described above, Peru and the Partner Country could also agree that the Cooperative Pilot Arrangement should deliver an overall mitigation in global emissions (“OMGE”), regardless of the transfer-route selected under the Cooperative Pilot Arrangement (Article 6.4 or Article 6.2).

One clear and simple manner would be for Peru and the Partner Country to agree on a percentage of the Option ITMOs that would be cancelled and not accounted for by any of the cooperating countries. The cooperating countries could also agree to increase the percentage of Option ITMOs to be cancelled in the second NDC Cycle, providing for a gradual increase in ambition through the Pilot Cooperative Arrangement. In order to remain consistent with possible changes in the International Rules, the cooperating countries could jointly agree on the cancellation percentage at the beginning of each NDC Cycle (once rules on the operationalization of the OMGE are clearer).

If serialised units are used, cancellation could occur by transferring the relevant Option ITMOs to a publicly available cancellation account (similar to the current CDM voluntary cancellation process under the CDM Registry). Peru and the Partner Country could also agree that the burden associated with the cancellation of Option ITMOs would be shared equally among the two countries, for instance by having the Partner Country paying the Strike Price for half of the Option ITMOs cancelled.

Box 6 - Alternative emission reduction sharing arrangements

Other alternatives exist for cooperating countries to allocate emission reductions produced by the SWS NAMA. For instance, the cooperating countries could agree on having all emissions reductions from the SWS NAMA which are achieved beyond the Sector Crediting Baseline during

the NDC Cycle (1) be deemed Option ITMOs and thus be subject to a Call Option right by the Partner Country. In contrast, for NDC Cycle (2), Peru would have no obligation to sell emission reductions to the Partner Country and could use all SWS NAMA emission reductions to over-achieve its NDC.

There are also other alternatives for the Pilot Cooperative Arrangement to deliver an overall (net) reduction in global emissions. This concept is expected to be further developed by the International Rules and its operationalization might involve a suite of options including not only the cancellation of units suggested in this Pilot Cooperative Arrangement, but also the use of more conservative baselines to ensure that the reductions go beyond business as usual.

6.6 Timing and method for corresponding adjustments

While options for the timing in which corresponding adjustments are needed are still being debated by Parties, there seems to be some advantages if host countries opt to make an accounting adjustment at the point of transfer. This could ensure a more complete information over ITMO-transfers, allow a clearer understanding of 'use rights' attached to an ITMO, and – in the event ITMOs are never used by the recipient country – lead to an OMGE.¹⁴⁶

Therefore, unless inconsistent with emerging International Rules, under the suggested Pilot Cooperative Arrangement, Peru would make an accounting adjustment for each Option ITMO immediately upon delivery of Option ITMOs to the Partner Country. In order to reinforce this notion, 'delivery' of an Option ITMO could be defined in a way that it is only deemed final and complete once Peru provides evidence of the accounting adjustment made for the relevant Option ITMOs transferred. This means that full legal title to contracted ITMOs would pass to the Partner Country upon delivery, evidence of the accounting adjustment made by Peru and the respective payment by the Partner Country.

With respect to how the corresponding adjustments are to be made, the suggested Pilot Cooperative Approach leaves open to the contracting parties to choose the accounting method that would apply. Hence, unless otherwise established by the International Rules, both Peru and the Partner Country would be free to choose either an emissions level or a budget-based approach. However, to facilitate the review of NDC accounting under the enhanced transparency framework, Peru and the Partner Country could still agree on using the same reporting method to report transferred Option ITMOs.¹⁴⁷ This would also ease understanding of the transaction by the international community, adding further transparency to the Pilot Cooperative Arrangement.

It is worth noting that accounting adjustments by Peru would only be required if and once the Call Option is exercised by the Partner Country.

¹⁴⁶ See A. Marcu and P. Zaman (2018). Strawman guidance on cooperative approaches referred to in Article 6, paragraph 2 of the Paris Agreement. REED Smith, ERCST, and ICTSD; and OECD and IEA (2017). Workshop Summary: Workshop on "Corresponding Adjustment" as part of Article 6 accounting Ottawa, Canada, February 20, 2017.

¹⁴⁷ See in this respect, Howard, A., Chagas, T., Hoogzaad, J., & Hoch, S. (2017). Features and Implications of NDCs for Carbon Markets, in: Swedish Energy Agency (2017). Reports on international cooperation for climate change mitigation

This is the only situation in which Peru would transfer the ownership over Option ITMOs to the Partner Country. In the event that the Partner Country opts not to exercise the Call Option or remains silent during any specific Call Option Exercise Period, that specific Call Option right would lapse and Peru would be able to retain the ownership over the Option ITMOs and count these towards its own NDC.

The Partner Country, in turn, would make its corresponding adjustment at the moment of acquisition, second transfer, or usage towards its NDC, pursuant to the agreed Article 6.2 guidance. If banking of ITMOs is allowed under the International Rules and the Partner Country opts to carry forward exercised Option ITMOs from one NDC cycle to another, the Partner Country would also have to observe the relevant International Rules on accounting adjustments for carry over. The Partner Country may also opt to acquire and then cancel (all or part of) the exercised Option ITMOs, in which case the Partner Country would put the relevant Option ITMOs out of circulation and ensure these ITMOs are **not counted** towards its NDC.

6.7 Disbursement of the Call Option Premium

Under the suggested Pilot Cooperative Arrangement, the Partner Country agrees to pay the Call Option Premium in successive tranches. Payment would be subject to Pre-Agreed Payment Milestones for each relevant tranche. Only once Peru has satisfied the relevant set of Pre-Agreed Payment Milestones applicable to each Tranche, the Partner Country would have the obligation to make the relevant tranche payment.

The Pre-Agreed Payment Milestones would have to be carefully discussed and negotiated before any possible MOPA is signed between the cooperating countries. They could be comprised of blend actions to strengthen regulatory and institutional capacities to participate in market-based approaches under the Paris Agreement as well as project-level activities (completion of feasibility studies, installation of equipment on landfills, commissioning of mitigation and accounting in sanitary landfills).

In any case, it would make sense that the Pre-Agreed Payment Milestones are devised in a way that reinforces and complements on-going MRV work in Peru and assists the country in remaining consistent with its NDC accounting and reporting obligations under the Paris Agreement. Below we suggest, as an illustration, some possible Pre-Agreed Payment Milestones.

Table 13 - Possible pre-agreed payment milestones

Tranche	Amount	Conditions Precedent to Tranche Payment
Tranche 1 [December 2019]	EUR [--]	<ul style="list-style-type: none"> Peru and the Partner Country having clearly defined all activities that are part of the SWS NAMA and, in future, of the MOPA Peru having sought and obtained agreement from relevant international donors on proper attribution of international climate finance and emission reductions deriving from the SWS NAMA
Tranche 2 [December 2020]	EUR [--]	<ul style="list-style-type: none"> Peru having communicated a new, or updated its current, NDC pursuant to Article 4 of the Paris Agreement and emerging International Rules Peru having made public a (revised) NDC Implementation Plan that: (i) clarifies how the NDC pledges are reflected in or apportioned to the Peruvian solid waste sector; (ii) explains how the different activities of the SWS NAMA are expected to contribute to achieving NDC unconditional and conditional pledges

		<ul style="list-style-type: none"> ▪ Commissioning of [add specific(s) landfill gas energy projects] ▪ Peru having developed, with the technical support from the Partner Country: (i) a Non-Binding Multi-Year Emissions Trajectory; and (ii) a SWS Crediting Baseline.
Tranche 3 [December 2021]	EUR [--]	<ul style="list-style-type: none"> ▪ The National Registry of Mitigation Actions (NRMA) being fully functional and the registration of the SWS NAMA in the NRMA ▪ The SWS Crediting Baseline having undergone a third-party independent review ▪ Version 3 of the SIGERSOL being fully operational and at least [add number] of municipalities having received technical capacitation to use and feed the system with adequate information.

6.8 Use of the Call Option Premium

The use of the Call Option Premium could also be regulated by the future MOPA. The cooperating countries could agree, for instance, that a specific portion of the Call Option Premium would be applied to increase preparedness for participating in Article 6.2 cooperative approaches, including, for instance, constructing the SWS Crediting Baseline, engaging an independent third-party to review the SWS Crediting Baseline, complementing on-going efforts for implementing the Infocarbono and the NRMA, and establishing a NAMA Financing Vehicle.

Depending on the total sum available for the Call Option Premium, the amounts disbursed could also be used to finance actual mitigation activities within the SWS NAMA. In this case, a certain portion of the Premium could be disbursed directly into a NAMA Financing Vehicle and could be used to further mobilize private sector finance in the Peruvian solid waste sector. Peru would agree to incorporate the NAMA Financing Vehicle pursuant to financing arrangements to be agreed jointly between Peru and the Partner Country and included as an Annex to the MOPA (the “NAMA Financing Arrangements”). The portion of the Call Option Premium disbursed directly into the NAMA Financing Vehicle would thus be managed and applied in accordance with these NAMA Financing Arrangements.

This NAMA Financing Arrangements could be based and build on the recommendations contained for the creation of a NAMA fund in the NAMA Concept Note.¹⁴⁸ For instance, the financing vehicle could be structured as a public-private revolving fund that combines Peruvian domestic resources with international multilateral and bilateral finance to mobilize further investments in the solid waste sector.¹⁴⁹

The NAMA Financing Arrangements could also specify the cost sharing arrangement between Peru and the volume of finance to be disbursed by the NAMA Financing Vehicle, as suggested in the NAMA Concept Note.¹⁵⁰ By directing international climate and carbon finance (and consolidating the rights to emission reductions) into a single financing entity, Peru could streamline the process of identifying eligible project activities within the SWS NAMA and negotiating with landfill operators, reducing overall transaction costs. Possible tasks attributed to the NAMA Financing Vehicle could include to:

- Assess and select possible beneficiaries willing to participate in the SWS NAMA and receive funding from the Financing Vehicle;

¹⁴⁸ MINAM (2014) [Solid Waste NAMA Concept Note](#).

¹⁴⁹ MINAM (2014) [Solid Waste NAMA Concept Note](#).

¹⁵⁰ MINAM (2014) [Solid Waste NAMA Concept Note](#).

- Disburse resources to landfill operators pursuant to the NAMA Financing Arrangements;
- Take full legal title to emission reductions from selected landfill operators and be able to market and transfer these to the Partner Country and/or other interested international buyers; and
- Report on an on-going basis to the Ministry of Environment, easing domestic coordination on approving domestic projects and managing emissions reductions from the solid waste sector in Peru.

Furthermore, the NAMA Financing Vehicle should also be able raise resources from different investors, donors and countries. It could make use of different funding windows to distinguish between (and make a clear attribution of) domestic investments, international bilateral/multilateral climate finance, investments earmarked for ITMO-transactions, and emission reductions to be sold and used under other international regimes. As an example, Option ITMOs not exercised by the Partner Country could potentially be sold under CORSIA or another international mandatory or voluntary regime (Figure 6). The NAMA Financing Arrangements would identify and detail the selection criteria applicable to (public and private) operators of solid waste services, including criteria associated with:¹⁵¹

- Location and appropriateness of technology used;
- Types of mitigation intervention applied;
- Additionality of the project activity;
- Financial capacity of the operator;
- Contribution to sustainable development and SDGs;
- Compliance with existing laws, in particular with the reporting requirements of the new waste management regulation (Supreme Decree n. 014-2017).

The selection criteria of the NAMA Financing Vehicle would be designed in a way that is fully aligned with current efforts being undertaken by MINAM to group Peruvian municipalities into priority territories, according to geographical characteristics, location, population size, waste collection and disposal profile and costs.¹⁵² This could allow the NAMA Financing Vehicle to provide support not only individual operations, but also to consortia of municipalities or districts, optimizing investments and financial returns.

The selected beneficiaries would be entitled to financial assistance in the form of low-interest rate loans and other types of concessional finance.¹⁵³ In exchange, the selected beneficiaries would assign all rights to existing and future emission reductions derived from their project activities in the solid

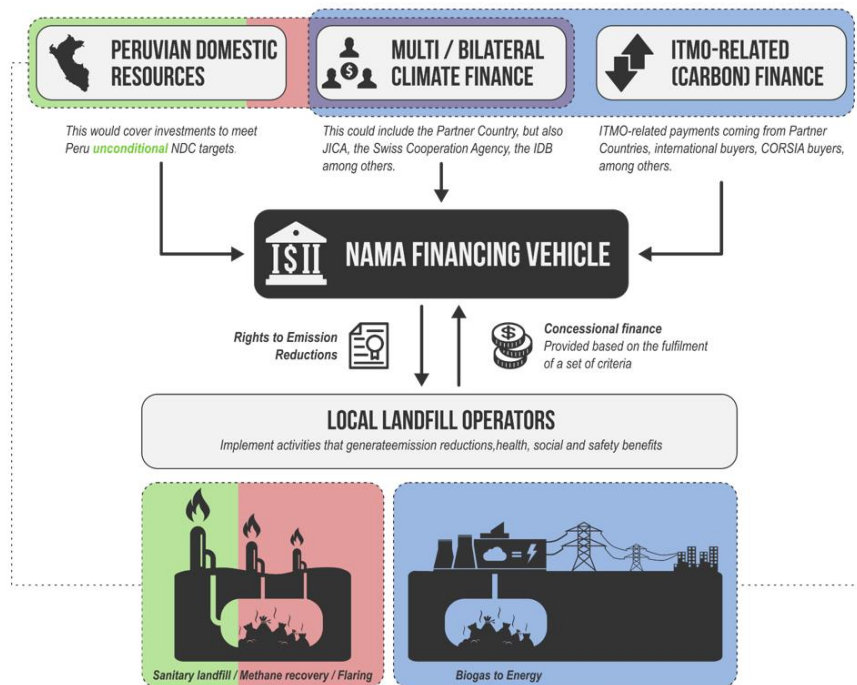
¹⁵¹ In this respect, the NPI and MINAM have already commissioned studies on the economic and financial criteria which could be established to select public and private operators to benefit from domestic and international finance, and how these criteria could be in practiced applied, as well as on the most effective technologies for the different Peruvian regions. See PWI and Perspectives (2017). Evaluación de Mecanismos Financieros Públicos, Privados y Público-Privados e instrumentos de política para los operadores de servicios seleccionados en ciudades consideradas en la NAMA en Residuos Sólidos. Not yet available online; and Organismo de Evaluación y Fiscalización Ambiental. (2016). Fiscalización Ambiental en Residuos Sólidos de gestión municipal provincial

¹⁵² Study on dumpsites carried out by MINAM and NEFCO. Not yet available online.

¹⁵³ MINAM (2014) [Solid Waste NAMA Concept Note](#)

waste sector to the NAMA Financing Vehicle. Therefore, those public and private entities willing to voluntarily participate in the initiative would authorize the NAMA Financing Vehicle to manage and transact the emissions reductions on their behalf.¹⁵⁴

Figure 6 – Role of the NAMA Financing Vehicle



6.9 Next steps

The proposed conceptual Pilot Cooperative Arrangement is an initial approach that provides the structure for Peru and the Partner Country to voluntarily engage in the transfer of ITMOs. A number of steps are however still needed for better clarity and understanding of this potential transaction:

- Developing a multi-year emissions trajectory for Peru’s first NDC and the SWS Crediting Baseline to estimate the volume of ITMOs that may be available for international transfer and included under the Pilot;
- Discussing with bilateral and multilateral financiers the support and investments intended as climate finance and the expected mitigation result that can be attributed to such layer of finance;
- Clarifying the unconditional and conditional (as well as beyond conditional) components of the SWS NAMA vis-à-vis the Peruvian NDC, to explain why Peru classifies a certain project or technology under one category or the other;
- Defining an emissions reduction sharing arrangement between Peru and the Partner Country based on the aforementioned assessment and discussions, which can eventually be integrated into the MOPA;
- Developing a more detailed assessment of how the NAMA Financing Vehicle can operate, including the amount of resources to

¹⁵⁴ If Peru enters into a MOPA with the Partner Country, Peru would need an agreement with the NAMA Financing Vehicle, where the latter assigns all rights to emission reductions produced by the SWS NAMA to the Peruvian Government.

be leveraged by (domestic and international) public and private sectors, conditions of finance and on-lending, operational modalities, and possibilities to ensure transfer and use of SWS technologies;

- Defining the appropriate seller in the potential MOPA. The entity to which the NAMA Financing Vehicle assigns the rights and transfers the legal title to emission reductions may become the seller. Alternatively, the NAMA Financing Vehicle may assign its acquired rights and legal title to the Government of Peru that then becomes the seller;
- Negotiating and signing a term-sheet to set key contractual obligations and commercial arrangements for a possible future MOPA, including conditions precedent, type and amount of upfront payments, the Pre-agreed Payments Milestones, ITMO delivery obligations and the unit price to be paid upon the delivery of ITMOs.