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# VOLUNTARY CARBON MARKET

Landscape, Opportunities and Challenges for  
Private Sector Engagement in Nepal







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Private Sector Engagement in Nepal**

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**United Nations Development Programme**

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## ABBREVIATION AND ACRONYMS

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<b>ACR</b>	American Carbon Registry
<b>AEPC</b>	Alternative Energy Promotion Center
<b>AES</b>	Applied Energy Services
<b>AFOLU</b>	Agriculture, Forests and Other Land Use
<b>AR6</b>	Sixth Assessment Report
<b>CAR</b>	Climate Action Reserve
<b>CCP</b>	Climate Change Policy
<b>CDM</b>	Clean Development Mechanism
<b>CF</b>	Climate Forward
<b>CMP</b>	Conference of Parties serving as the Meeting of Parties
<b>COP</b>	Conference of Parties
<b>CORSIA</b>	Carbon Offsetting and Reduction Scheme for International Aviation
<b>CSR</b>	Corporate Social Responsibility
<b>DNA</b>	Designated National Authority
<b>EPA</b>	Environment Protection Act
<b>EPR</b>	Environment Protection Rules
<b>FAR</b>	First Assessment Report
<b>FPIC</b>	Free Prior Informed Consent
<b>GCC</b>	Global Carbon Council
<b>GHG</b>	Greenhouse Gas
<b>GoN</b>	Government of Nepal
<b>GS</b>	Gold Standard
<b>ICS</b>	Improved Cooking Stoves
<b>ICVCM</b>	Integrity Council for Voluntary Carbon Markets
<b>IETA</b>	International Emission Trading Association
<b>IFM</b>	Improved Forest Management
<b>INGO</b>	International Non-Government Organization
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>IPPU</b>	Industrial Processes and Product Use
<b>ITMO</b>	Internationally Transferred Mitigation Outcomes
<b>KP</b>	Kyoto Protocol
<b>LDC</b>	Least Developed Country
<b>LFI</b>	Local Financial Institutions
<b>LoA</b>	Letter of Approval
<b>LTS</b>	Long Term Strategy for Net Zero Emission
<b>MoFE</b>	Ministry of Forests and Environment
<b>NBS</b>	Nature Based Solutions
<b>NDC</b>	Nationally Determined Contributions
<b>NGO</b>	Non-Government Organization
<b>OIMP</b>	Other International Mitigation Purposes
<b>PV</b>	Plan Vivo
<b>REDD</b>	Reduced Emissions from Deforestation and Forest Degradation
<b>SDG</b>	Sustainable Development Goals
<b>SNC</b>	Second National Communications
<b>TNC</b>	Third National Communications
<b>ToR</b>	Terms of Reference
<b>UNDP</b>	United Nations Development Program
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>USD</b>	United States Dollars
<b>VCM</b>	Voluntary Carbon Market
<b>VCS</b>	Voluntary Carbon Standard
<b>VER</b>	Verified Emissions Reductions
<b>VVB</b>	Validation and Verification Body

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## ACKNOWLEDGEMENT

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## ASSESSMENT SUMMARY

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Climate change poses a significant global threat, driven by the gradual warming of the Earth due to increased greenhouse gas (GHG) concentrations, primarily from human activities. The United Nations Framework Convention on Climate Change (UNFCCC), established in 1992, aimed to stabilize atmospheric GHG concentrations to prevent dangerous anthropogenic interference with the climate system. Intergovernmental Panel on Climate Change (IPCC), in its Sixth Assessment Report (AR6) released in 2021 underscored the urgent need for action, emphasizing that human influence has unequivocally warmed the planet and urging immediate reductions in GHG emissions to limit global warming to 1.5 degrees Celsius. Given the longevity of CO<sub>2</sub> in the atmosphere, mitigation efforts require meticulous planning to reduce while also exploring the best ways to achieve a net reductions of GHGs from the atmosphere. This report focuses on one such approach, Voluntary Carbon Markets (VCM), as a means to reduce GHG emissions. The report aims to scope the existing VCM projects in Nepal and recommend measures to create enabling environment for the private sector involvement.

VCM have emerged as a flexible mechanism for both private and public sector entities seeking to voluntarily offset emissions. Unlike the regulatory frameworks like the Clean Development Mechanism (CDM), the VCM allows companies to self-introduce emission targets aligned with their climate objectives, often complementing their business strategies or Corporate Social Responsibility (CSR) initiatives. The significance of VCMs has been underscored in various UNFCCC meetings, notably during COP 21 in Paris (2015), which highlighted the complementary nature of voluntary actions in order to achieve Nationally Determined Contributions (NDC) targets. The pivotal role of non-state actors, including voluntary carbon markets, has been increasingly recognized in strengthening climate ambition. With the urgent need to limit global temperature rise, countries are turning to ambitious NDCs, where the engagement of the private sector through VCMs becomes crucial for mobilizing mitigation finance, technology transfer, and innovation, thus contributing to multiple Sustainable Development Goals (SDGs) and aiding in meeting emissions reduction targets committed through NDCs.

Article 6 of the Paris Agreement was introduced to facilitate international cooperation in addressing climate change through voluntary mechanisms. Article 6.2 specifically outlines modalities for ensuring the transparent transfer of GHG emission reductions and removals between countries, preventing double counting of emissions under different NDCs. This provision allows for the authorization of emission reductions generated by VCM activities to contribute towards the NDCs of other countries or international mitigation efforts. Additionally, Article 6.4 of the Paris Agreement lays the groundwork for a new market mechanism similar to the Clean Development Mechanism (CDM).

The Environment Protection Act (EPA) of 2019, along with the Environment Protection Rules (EPR) of 2020, lay down provisions for climate change management and carbon trading in Nepal. These legislative frameworks mandate periodic assessments of climate change impacts, the preparation of adaptation plans, and the management of climate change risks. They also enable the government's participation in carbon trading through international mechanisms or private sector entities. Additionally, Nepal's climate policies, such as the Climate Change Policy of 2019, Development Cooperation Policy of 2019, and Environment Policy of 2019, provide overarching guidance for climate action, carbon financing, and sustainable development. These policies prioritize sectors like agriculture, forestry, energy, and tourism for climate mitigation and adaptation measures, emphasizing renewable energy adoption, forest conservation, and technology transfer.

Nepal's Second NDC sets ambitious targets for greenhouse gas emissions reduction, contingent upon international support. To achieve these goals, Nepal seeks financial assistance, technology transfer, and capacity-building support from global funds and bilateral/multilateral agencies. Moreover, Nepal's Long-term Strategy for Net-zero Emissions

(LTS) outlines comprehensive strategies for combatting climate change and promoting sustainable development. It prioritizes clean and renewable energy adoption, sustainable land use management, industrial sustainability, and international cooperation to align climate actions with global efforts and achieve net-zero emissions targets.

The VCM sector assessment for Nepal underscores the country's strategic positioning to benefit from potential carbon financing opportunities. While the unconditional NDC targets focus on hydropower development, conditional targets offer diverse opportunities across renewable energy, energy efficiency, transportation, afforestation, and more. Nepal's GHG inventory highlights agriculture as a consistent major emitter, emphasizing the need for targeted interventions. Despite progress in carbon project development, Nepal's VCM portfolio is dominated by household cooking energy projects, indicating a lack of diversification across sectors. However, opportunities exist in agriculture, forestry, livestock, and energy sectors, with potential for low hanging projects like electric cooking. Moreover, a global shift towards Nature-based Solutions (NBS) projects, signals the future investment prospects and this needs to be tapped by the private sector while striving to diversify VCM portfolio beyond traditional carbon project models and achieve ambitious climate targets.

The VCM operates through engagement from various stakeholders, including project developers, standards bodies, investors, and credit off-takers, without direct government regulation. This decentralized nature of VCM, governed by international NGOs, results in varied standards across jurisdictions. Despite most VCM projects being in developing countries, there's a limited understanding of VCM among governments, hindering its potential to complement government climate actions. However, under the Paris Agreement, Article 6.2 presents an opportunity for VCM alignment, enabling the recognition of voluntary efforts and preventing double counting of emissions reductions through internationally transferable mitigation outcomes (ITMOs). This integration requires adjustments in national registries and agreements between participating countries, offering a pathway for VCM to coexist with compliance mechanisms outlined in the Paris Agreement.

Under the shades of Paris Agreement, the role of the government in the VCM can be multifaceted. Governments can act as facilitators by establishing frameworks and safeguards to oversee VCM projects, formulate policies and regulations to create a conducive environment for VCM investments, and actively participating in project development. They play a pivotal role in ensuring stability and clarity for VCM transactions, delineating guidelines governing VCM involvement, and avoiding double counting of emissions reductions. Moreover, governments can align VCM projects with their NDCs and leverage VCM to finance NDC implementation plans, identifying suitable interventions for climate or carbon finance and scoping mitigation commitments laid down in the NDC.

Additionally, governments are responsible for setting up institutional mechanisms to oversee VCM engagement, such as establishing a DNA for the Paris Agreement, which can facilitate VCM project development and coordinate with relevant stakeholders. Governments should also define share-of-proceeds mechanisms resulting from VCM transactions and set fees for enrolment in national registries to ensure transparency and accountability. Furthermore, governments can lead by example by participating in VCM projects, especially in sectors requiring active government involvement or those that need heavy public finance. By actively engaging in VCM activities, setting conducive policies, and ensuring integrity and transparency, governments can establish Nepal as a destination for quality credits, driving demand and ensuring better prices in the offset project market.

The private sector influences the size and scale of VCM through various roles within the value chain. From standard setting bodies to end consumers, non-state actors drive the entire VCM value chain. In the context of VCM projects in Nepal, the local private sector can assume roles such as project investors, implementers, consultants, or intermediaries. Understanding their roles within the project cycle is essential for effective participation. For

instance, while a project requires significant capital investment and this has to be managed by the investors or project developers; getting enrolled with the project as implementer allows private sector contribute be in the centre of the game without requiring any upfront investment. At the same time private sector engagement is hindered by several barriers and risks. Challenges include governance agility, with delays in obtaining approvals and unclear communication channels impeding project development. Capacity constraints within the private sector, particularly in sectors beyond energy, further limit project development. Moreover, knowledge gaps among government staff pose challenges, highlighting the need for targeted training and capacity-building initiatives to enhance awareness of market dynamics and project requirements among relevant officials.

Similarly, perceived risks also deter private sector involvement in VCM projects, including concerns about policy volatility and government appropriation of emission reduction credits. Without clear recognition and support from the government, transactions may face nullification risks, impacting project viability and investor confidence. Additionally, the risk of double counting underscores the importance of government action in creating centralized repositories to track project progress and implementation areas. Addressing these barriers and risks through proactive government engagement and regulatory frameworks aligned with international agreements like the Paris Agreement can foster a conducive environment for private sector participation in the VCM, driving sustainable climate action and investment.

With the Paris Agreement in effect, most VCM projects are poised to be embedded as article 6.2 projects, aligning with NDC targets that recognize carbon financing as a means to achieve climate goals. As Nepal opens up to new mitigation areas, particularly in AFOLU and Energy sectors, detailed sector assessments based on recent data are crucial for identifying feasible VCM projects. Government facilitation, including the timely establishment of a DNA and clear procedures for acknowledging VCM projects, is required to avoid compromising NDC targets. Establishing guidelines for project financing, central repositories, and interoperable registries, potentially leveraging the experience of agencies like AEPC, can further streamline VCM operations, safeguard private sector investments, and reassure stakeholders amidst regulatory uncertainties.



# INTRODUCTION



## 1.1 Climate Change Context

Climate change is one of the major threats the world has ever faced. The process of gradual warming of the earth due to increased concentration of greenhouse gases (GHG) is expected to impart multi-faceted impacts that interfere with the environmental, social and economic systems. Rising concentration of atmospheric CO<sub>2</sub> was observed; however, the global community realized the need of wider consensus to reduce global GHG concentration only in 1989 when the Intergovernmental Panel on Climate Change (IPCC) released its first assessment report (FAR) with an indication that the global GHG concentrations have increased as a result of human activities. As a result, United Nations Framework Convention on Climate Change (UNFCCC) was negotiated. This global framework treaty was opened for signature in 1992 at Earth Summit and ultimately entered into force in 1994.

The convention recognized the need to stabilize the atmospheric concentration of the GHGs. Article 2 of the convention set out the objective of the convention and any other legal instruments related to the convention as *“to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.”*

In its Sixth Assessment Report (AR6) released in 2021, the Intergovernmental Panel on climate change Climate Change (IPCC) came up with an alarming assessment of the current state of the climate. It highlighted that human influence has unequivocally warmed the planet, causing widespread and rapid changes across Earth's systems. AR6 emphasizes that global temperatures have risen faster than previously estimated, with the past decade likely being the hottest in over 125,000 years. The report outlines the severe impacts of these changes and reiterates the urgency of limiting global warming to 1.5 degrees Celsius above pre-industrial levels to avoid catastrophic consequences, underscoring the need of immediate and drastic reductions in greenhouse gas emissions.

## Human influence has warmed the climate at a rate that is unprecedented in at least the last 2000 years

### Changes in global surface temperature relative to 1850–1900

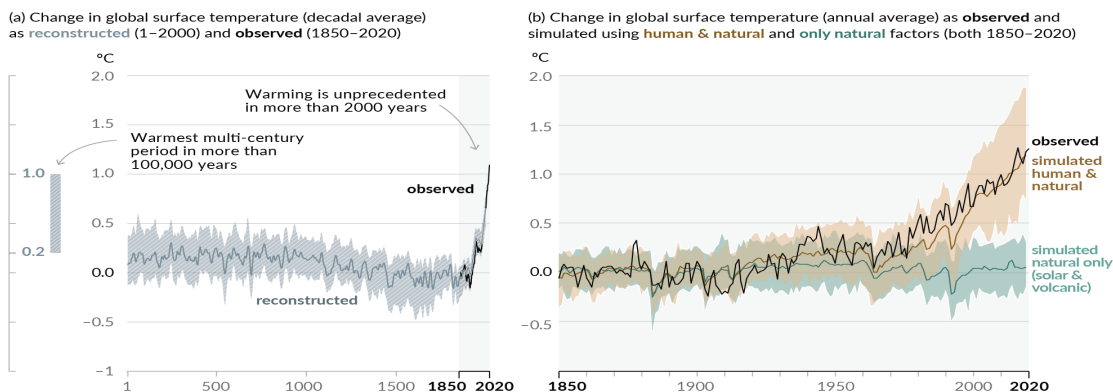


Figure 1: Changes in global surface temperature relative to 1850–1900 (IPCC AR6)

Rising temperatures and largely so due to the human activities demands for an urgent mitigation action. Provided that CO<sub>2</sub> has high atmospheric longevity, the effect of the every molecule CO<sub>2</sub> added will endure in atmosphere for 300–1,000 years<sup>1</sup> thereby affecting changes on timescale of several generations. This implies that any mitigation activity done now may not show results with immediate effect thereby making increase in temperature inevitable. This demands for a meticulously planned and implemented mitigation activities. Meanwhile, as the process of scavenging CO<sub>2</sub> in the atmosphere might take sufficiently long, people need to cope with the rising temperature and the consequences brought about by it. Therefore, the mitigation of GHGs is inevitable to curb temperature rise and thus the climate change; meanwhile on a scale of one human generation, adapting to the changing climate is also equally important. This report focuses on one of the approaches to reduce GHG emissions; the Market Mechanism.

## 1.2 Market Instrument for Mitigation of GHG Emissions

The market instrument to mitigate atmospheric emissions of the gaseous pollutants was introduced under the “Acid Rain Programme” wherein cap-and-trade system was introduced to reduce the Sulphur Dioxide (SO<sub>2</sub>) concentration in the atmosphere. This program was launched in the early 1990s in the USA as an amendment to the Clean Air Act of 1990 and focused on reducing SO<sub>2</sub> emissions from power plants. This system set a limit (cap) on the total amount of SO<sub>2</sub> that could be emitted by power plants. Participating plants were allocated allowances equivalent to their emission limits. They could then buy, sell, or trade these allowances among themselves. The success of the Acid Rain Program in reducing SO<sub>2</sub> emissions served as an early model for subsequent emissions trading systems, including those focused on greenhouse gases, and it laid the groundwork for the development of carbon markets to mitigate GHG emissions.

Later in 1997, the concept of cap-and-trade was formally introduced through the Kyoto Protocol (KP), an instrument under the UNFCCC. The convention emphasized on the principle of “*common but differentiated responsibilities*” among the developed and developing country parties and kept onus on the developed country parties to assist the developing country parties in their act for combating climate change by channelling new funds. KP was instrumental in securing commitments of the developed country parties with a binding emission reduction targets. Depending on the transacting parties,

<sup>1</sup> <https://climate.nasa.gov/news/2915/the-atmosphere-getting-a-handle-on-carbon-dioxide/>

the KP envisioned three different mechanisms in form of the Emission Trading, Joint Implementation and the Clean Development Mechanism (CDM). The CDM, a mechanism introduced to facilitate emission offset between the developed and developing country parties went on to establish as the prominent standard for project development for the transaction of emission reductions. With the end of the second commitment period of Kyoto Protocol in 2020, CDM is undergoing a transition into Sustainable Development Mechanism (SDM); however, the rules pertaining to SDM are yet to be finalized.

The cap-and-trade approach (see **Figure 2**) allows flexibility in emissions reductions. Companies that reduced emissions below their allocated allowances could sell or bank the excess allowances, while those unable to meet their targets had to either purchase allowances or invest in low carbon approaches to comply with the regulations. By its very nature, offsetting emissions tends to be cost effective and in order to achieve cost-effectiveness in reducing atmospheric concentration of GHGs, created a demand and supply chain between the developed and developing countries respectively.

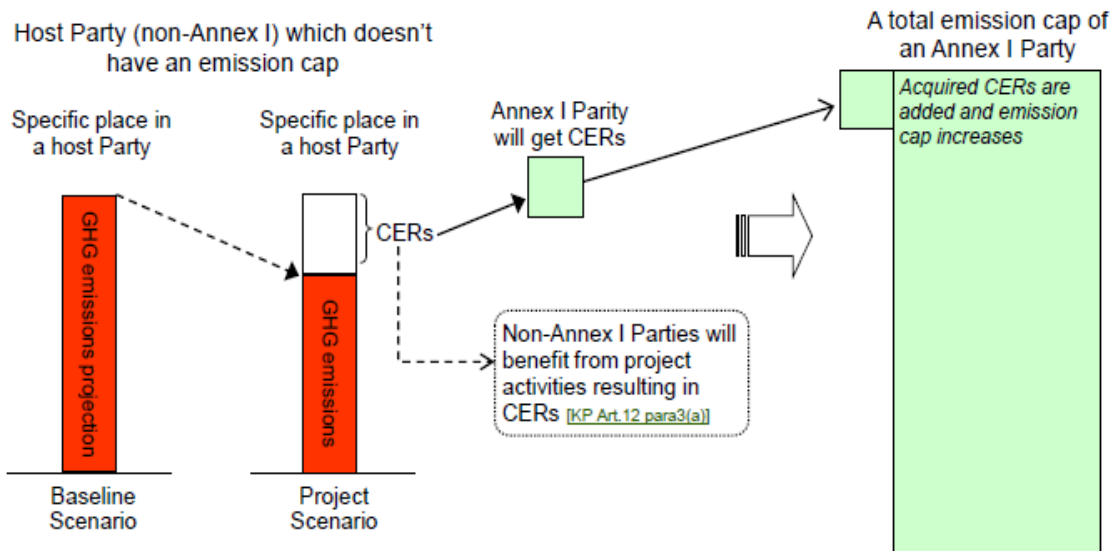


Figure 2: Depiction of CDM project

Source: IGES, 2018<sup>2</sup>

### 1.3 Voluntary Carbon Markets

Unlike the CDM or the regulatory market, a parallel market mechanism stemmed out to cater the need of the private and the public sector companies that wished to voluntarily offset emissions attributable to their operations. Collectively known as the Voluntary Carbon Markets (VCM), the projects registered under different VCM standards supply the emission reduction units to climate accountable businesses. As the name suggests, under VCM, there is no legally binding cap for the emissions or emission allowances allocated for a business entity which however are self-introduced by respective entities in pursuance of their own climate targets. Usually, such targets set and the offsets used by respective business entities are used to complement their respective business promotion strategies. Alternately, they also serve as the area of investment of Corporate Social Responsibility (CSR) funds of the respective businesses or initiatives.

<sup>2</sup> CDM+IN+CHARTS\_ver30.pdf (iges.or.jp)

Not merely in private space, the spotlight on VCMs traces back to various Conference of the Parties (COP) meetings under the United Nations Framework Convention on Climate Change (UNFCCC). As early as during the COP 6 in The Hague (2000), the significance of non-state actors and voluntary actions in curbing emissions found mention. Subsequent meetings, such as COP 15 in Copenhagen (2009), acknowledged the pivotal role of private sector involvement and voluntary initiatives in global emission reduction efforts. However, the turning point arrived at COP 21 in Paris (2015) with the groundbreaking Paris Agreement. While primarily emphasizing the NDCs, the accord highlighted the complementary nature of voluntary actions and cooperative approaches. This pivotal agreement recognized the importance of non-state actors, including voluntary carbon markets, in fortifying climate ambition.

COP 26 in Glasgow (2021), where discussions surged around the rules and guidance for Article 6 of the Paris Agreement. This article facilitates international cooperation and lays the groundwork for market mechanisms. It emphasizes the role of voluntary cooperation between countries and paves the way for non-state actors, particularly the private sector, to partake in emission reduction endeavors. Throughout these climate summits, while the primary focus rested on countries' commitments, the rise of voluntary carbon markets gained prominence. Their potential to drive additional emission cuts, foster innovation, and foster collaborations among governments, corporations, and civil society has increasingly garnered acknowledgment as a pivotal force in the global climate agenda.

Considering the need of peaking the atmospheric concentration of the GHGs at the soonest possible, in order to limit global temperature rise below 1.5°C by the end of the century, countries around the world have set out ambitious national commitments, through their NDCs. Achieving NDC targets is subject to the mobilization of mitigation finance at scale, technology transfers and innovation. Engagement of private sector is inevitable to mobilize mitigation finance at scale while enabling technology transfer and contribution to multiple SDG indicators. Moreover, as compliance market is yet to take shape, VCM can be contextual tool towards meeting emissions reduction target committed through NDC.

## 1.4 The Paris Agreement and VCM Linkage

The 21<sup>st</sup> Conference of Parties (COP 21) to UNFCCC held at Paris, France in December 2015 adopted an agreement - popularly known as Paris Agreement - to deal with the GHG emissions mitigation, adaptation and finance. Article 6 of the Paris Agreement provisions the integrated and holistic approaches to assist governments in implementing their Nationally Determined Contributions (NDC) to the global response to climate change through voluntary international cooperation. This establishes a policy foundation for an emissions trading system to enable transactions of Internationally Transferred Mitigation Outcomes (ITMO) or carbon credits. The rulebook for the new market mechanism under Paris Agreement is under development. Under this mechanism (also known as article 6.4 mechanism), parties with low emissions would be allowed to sell their exceeding allowance to other parties, a mechanism alike the preceding CDM.

The significance of the VCM lies in its ability to align with Article 6.2 of the Paris Agreement, offering a pivotal platform for international cooperation and the exchange of emissions reductions between nations. For Nepal, despite its potential for GHG reductions across diverse sectors, limited engagement with the global carbon market has been observed. Establishing connections between VCM activities and the Article 6 rules under the Paris Agreement becomes crucial, as it not only harmonizes Nepal's



potential with international climate commitments but also outlines a pathway for private sector participation to optimize benefits from both voluntary and compliance-driven carbon markets.

Article 6 of the Paris Agreement provides flexibility to governments to engage in voluntary cooperation in the implementation of Nationally Determined Contributions (NDCs) “to allow for higher ambition in their mitigation and adaptation actions” (Article 6.1 Paris Agreement). This includes engaging with the VCM. The rules that govern this voluntary cooperation open the door to carbon market transactions under the Paris Agreement that may overlap, integrate, or, in the case of Article 6.4, compete with VCM activities.

Article 6.2 of the Paris Agreement provides modalities and guidance to ensure that activities that transfer GHG emission reductions and removals (‘mitigation outcomes’) do not result in the double counting of GHG emission reductions and removals under more than one NDC. A host country can authorize the use of GHG emission reductions and removals generated by a VCM activity towards the NDC of another country, other international mitigation, or other purposes. In this case the activity will need to comply with the Paris Agreement Article 6.2 implementation guidance. GHG emission reductions and removals can also be authorized to count towards the NDC of another country, other international mitigation commitments or other purposes. In that case, the country where the mitigation action took place (the “host country”) needs to ensure that the authorized GHG emission reductions and removals are not counted towards its own NDC.

Article 6.4 of the Paris Agreement defines a mechanism that can be understood as a modified and ‘improved’ version of the Clean Development Mechanism (CDM). The rules and modalities that govern Article 6.4 mechanism are still being developed. Once they are operational, the Article 6.4 supervisory body will register projects, and countries will be able to approve and authorize activities under Article 6.4. It is unlikely that VCM activities will seek approval under Article 6.4. Instead, Article 6.4 directly competes with standards that offer the certification of VCM projects. Companies may choose to invest in activities approved under Article 6 rather than in VCM carbon credits.

## 1.5 Objectives and Scope

UNDP has appointed the consultant to prepare a scoping report of existing voluntary carbon projects in Nepal and provide recommendations for creating an enabling environment for private sector involvement in these initiatives. The objective of the assignment is to take stock of the existing carbon projects/Programs of Nepal to account GHG emission reduction options especially from the private sector. The scope of works covered by this assessment is summarized below:

- Sector assessment, identification of problems and investment opportunities for low carbon development
- Stocktake prevailing VCM standards and status of the engagement of private sector and CSOs
- Recommend activities to enhance the enabling environment and associated institutional strengthening activities for private sector participation
- Prepare a scoping assessment and validate with the stakeholders

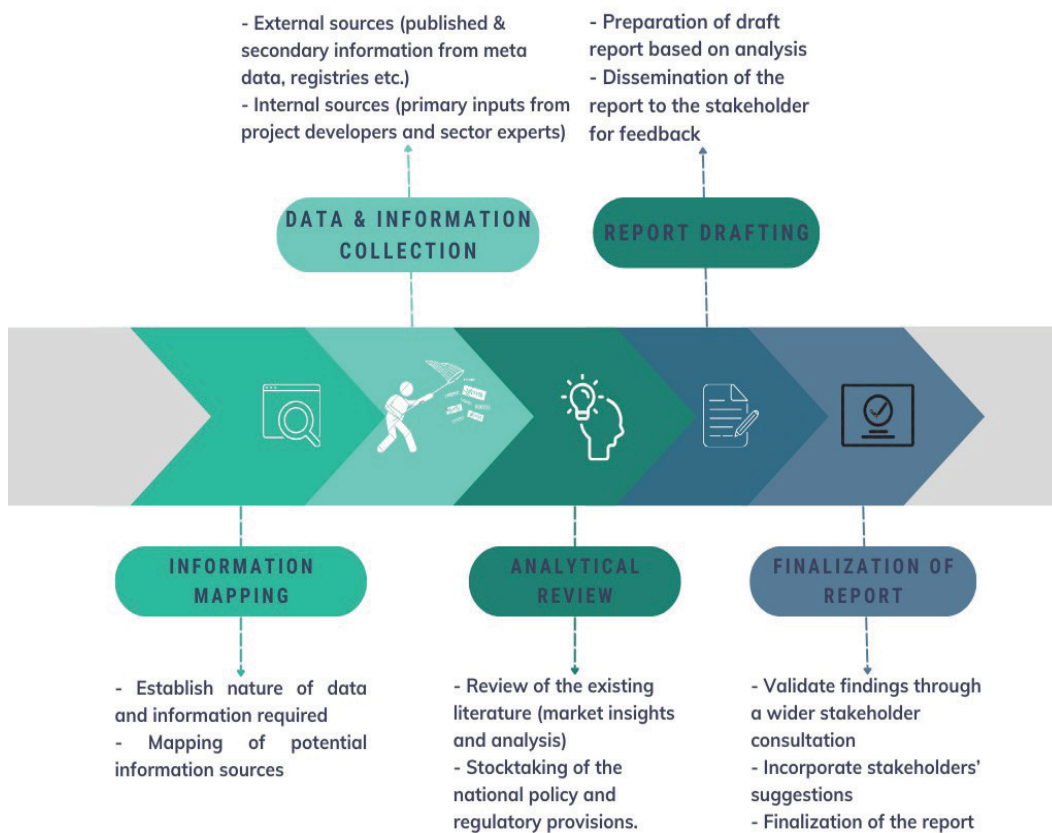
## 1.6 Limitation

The nature of the assessment demands an assessment of the projects and programs developed across various standards. The assessment report is an outcome of the extensive desk study coupled with few discussions held with the existing and potential project developers. In order to identify stakeholders, the participating entities in the stakeholder consultation programme organized by the Ministry of Forests and Environment (MoFE) in early October, 2023 were considered. For the purpose of the assessment, the consultant referenced the projects and programmes listed across the prominent VCM standards.

# ASSESSMENT METHODOLOGY

# 2

The methodology adopted for the assessment is based on the review of published data and information. This report has been prepared after an analysis of the national policies and legal framework at hand, and information sourcing from available literature from the credible sources. **Figure 3** presents the methodological flow adopted for the purpose of the assessment.



**Figure 3: Methodological flow of the study**

Pertinent information required for the purpose of assignment was identified based on the scope of works defined in the ToR. As the assignment's key objective is to stocktake VCM projects; specifically the consultant took stock of the national policy landscape, status of projects development and facts and figures regarding the development of VCM projects globally and in Nepal. Extensive web research was conducted along with the scanning of the registries of various VCM standards. Considering the exclusivity in distribution of registered VCM projects in two VCM standards; the Voluntary Carbon Standard (VCS) and the Gold Standard (GS), projects statistics from these standards are used in context of Nepal. In order to understand the relative position of Nepal in the VCM, comparative assessment of project registration and issuances is made against the Least Developed Countries (LDC) as a whole and closer comparison with the Bangladesh, it being LDCs and the South Asian counterpart.

Literature review for the assessment encompassed the review of convention texts of the UNFCCC and the KP, relevant decisions of Conference of Parties (COP) and VCM industry reports published by credible organizations. The review includes assessment of VCM industry data, including those from the registries of the respective standards and other environmental meta-registries; Markit registry<sup>3</sup> and the VCM dashboard<sup>4</sup> maintained by Climate Focus. The literature review comprised review national policies and strategies as well. As part of policy stocktake Climate Change Policy (2019), Environment Policy (2019) and Development Cooperation Policy (2019) are reviewed while second Nationally Determined Contributions (NDC) and Long-Term Strategy (LTS) for Net Zero Emissions are the strategies reviewed.

The consultant also engaged with the pertinent VCM value chain stakeholders in Nepal, mostly the project developers. Purpose of the stakeholder engagement was to have their opinion on the VCM project development and expectations to enhance policy conduciveness, procedures and strategies in order to scale-up the VCM investments in Nepal. The list of the stakeholders interviewed during the assessment is presented in **Annex-1**.

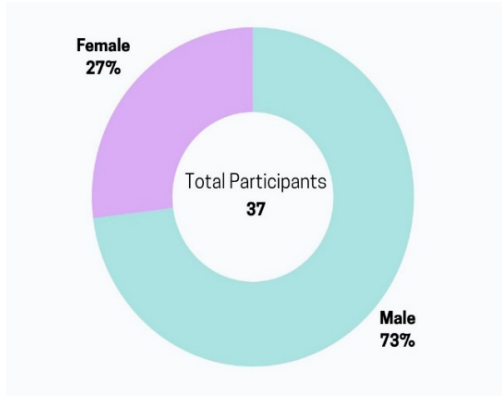
Based on data inputs, literature review and stakeholder interviews draft report is produced. The report is structured with the informative and analytical pieces of information. The analytical content of the report aligns to the best practices recommended by the VCM industry pioneers in terms of the stakeholder engagement, barriers and challenges, and recommendation. Through this report, the consultant attempts to recommend approaches to maximize private sector engagement aligned with the pace and direction global VCM landscape is heading towards.

The content of the report was validated through a validation workshop held on 22<sup>nd</sup> January 2024. Representatives from the government organization, private sector and development partners were invited to the programme. The validation workshop witnessed an encouraging participation, largely from the private sector stakeholders representing both the existing VCM project implementers and the potential project developers/implementers. The workshop was jointly hosted by the UNDP Nepal and the AEPC with a total 37 participants (10 female and 27 male) attending the workshop. The participants engaged in the lively discussion regarding the assessment outcomes; most of the stakeholder concerns were received in form of the clarification requests which the consultant responded during the workshop. Pertinent feedback provided by the stakeholders along with the review comments received in the draft are incorporated in the report. List of the participants attending the validation workshop and key points discussed by stakeholders is presented in **Annex-2**.

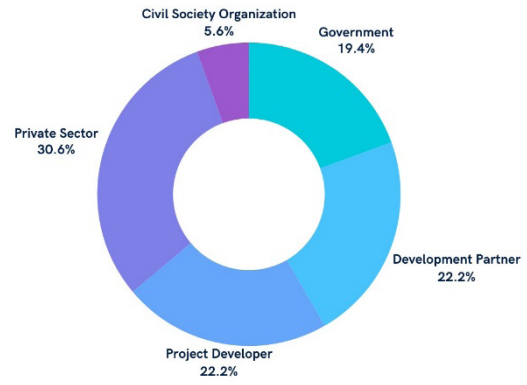
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<sup>3</sup> <https://mer.markit.com/br-reg/public/index.jsp>

<sup>4</sup> <https://climatefocus.com/initiatives/voluntary-carbon-market-dashboard/>



(a)



(b)

Figure 4: Workshop participant composition (a) by sex and (b) by organization represented



# VOLUNTARY CARBON MARKETS LANDSCAPE

# 3

## 3.1 Evolution and Growth of VCM

VCM serves as an arena where private entities, corporations, and various actors engage in the transaction of carbon credits, outside the realm of regulated carbon market; CDM, for example. Its primary objective is centred at contributing to mitigate climate change through the voluntary endeavours; to avoid, reduce or enhance sink of GHG emissions. In order to achieve this, the initiatives to reduce emissions associated with diverse sectors such as industry, transportation, energy, agriculture, and forestry and land-use may be adopted. Governed by independent board, each carbon standards establishes rules governing the generation, monitoring, and certification of GHG reductions and removals.

### 3.1.1 The Evolution

In the late 1980s, the notion of companies mitigating GHG emissions through carbon credits gained momentum, marking the inception of the VCM. Early initiatives saw private entities, such as Applied Energy Services (AES), an American energy company, engaging in carbon offset deals, like supporting tree planting projects with NGOs such as CARE in Guatemala. By the mid-1990s, the VCM witnessed the establishment of the Environmental Resources Trust, later rebranded as the American Carbon Registry (ACR). ACR emerged as the pioneering private registry solely dedicated to voluntary offsets within the United States. Subsequently, during the 2000s, the VCM experienced substantial growth, accompanied by the emergence of predominant private carbon standards like the Verified Carbon Standard (VCS), Gold Standard (GS), ACR, and the Climate Action Reserve (CAR). These standards played a significant role in shaping and governing the VCM landscape.

### 3.1.2 Growth and Distribution

Ever since the VCM came into effect, it has witnessed a growth trend. Initially supplying the demand for voluntary offsets by businesses, VCM are now recognized to cater the emission reduction offsets required for the governments to meet their NDC commitments. During the second commitment period of the Kyoto Protocol i.e. 2013 to 2020, the annual issuances from the VCM projects have witnessed a growth by four folds. This suggests the growing VCM markets even during the prominent offset mechanism in form of CDM was actively operating.

Year 2021 witnessed the largest issuance volume (352 million tons of CO<sub>2</sub> e) from the VCM. **Figure 5** depicts the evolution of carbon markets with reference to the four prominent carbon standards; the American Carbon Registry (ACR), the Climate Action Reserve (CAR), the Gold Standard (GS) and the Verified Carbon Standard (VCS). VCS, by far, holds the largest share of the VCM credits followed by the GS. There are yet other voluntary carbon standards functional; the Global Carbon Council (GCC), Plan Vivo (PV) and Climate Forward (CF) to name few. GCC shared 0.5% of the global issuances while PV and CF each shared <0.1% of global issuances as of April 2023. The GCC and the CF were established post Paris Agreement and have obvious

reasons of low market share. In case of PV, the standard mostly addresses projects that are nature based and hence have less number of portfolio, which is likely for the standard to have less credits issued although its establishment history dates back to 2001.

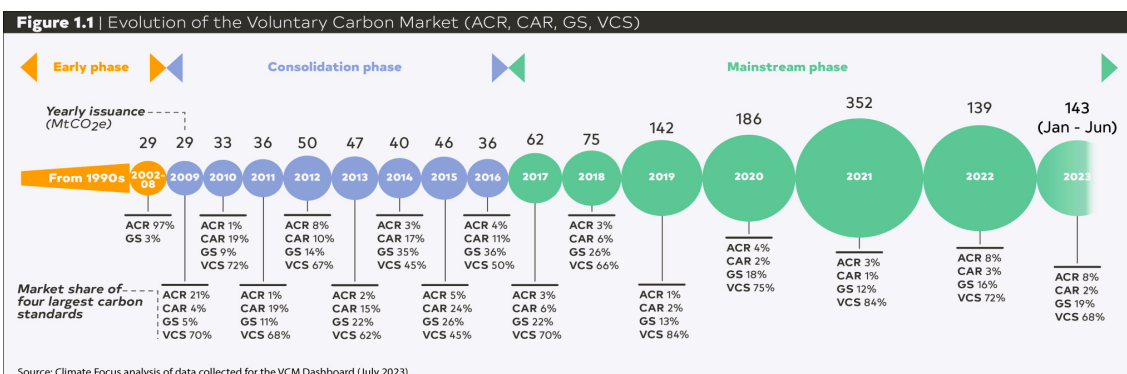


Figure 5: Evolution of the Voluntary Carbon Market (ACR, CAR, GS and VCS)

As of June 2023, based on an analysis<sup>5</sup> published by the Climate Focus, Southern Asia region holds the largest share in VCM, in terms of the total project registered and credits issued since 2002. This region boasts around one-fourth of all VCM projects registered and one-fifth of the entire credits issued. Southern Asia region is followed by the Eastern & Southern Africa region in terms of the total projects registered (19%) and Latin America & the Caribbean in term of the VCM credits issued (19.3%). Figure 6 presents the global distribution of the VCM projects.

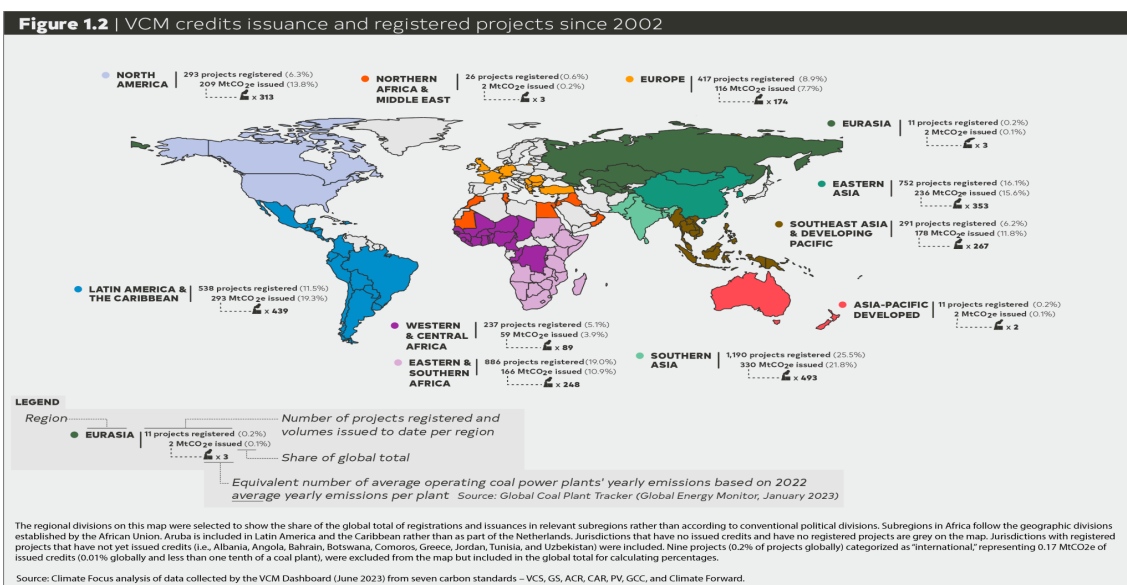


Figure 6: VCM credits issuance and registered projects since 2002

### 3.2 VCM Standards

As evident from the section 3.1.2 above, VCS and GS are the two prominent carbon standards globally. These two standards, provided their global presence and relative number of projects registered, the VCS and GS are introduced in the following sub-sections of this section.

<sup>5</sup> Chapter 1: What is the voluntary carbon market? – vcmprimer.org



### 3.2.1 The Voluntary Carbon Standard (VCS)

VCS, administered by VERRA, stands as a pioneering framework and certification program within the realm of voluntary carbon markets, driving credibility and transparency in emissions reduction projects worldwide. Established in the mid-2000s, VCS evolved as a response to the escalating demand for trustworthy and robust standards guiding the assessment and verification of GHG mitigation initiatives. This standard gained prominence by offering a comprehensive set of guidelines and methodologies, attracting diverse entities – from corporations to NGOs – keen on offsetting their carbon footprints. The VCS serves as a blueprint for an array of projects, spanning renewable energy installations, afforestation efforts, energy efficiency enhancements, and methane capture initiatives. Its inception stemmed from a collaborative effort involving leading environmental organizations and experts, recognizing the urgent need for a credible and universally accepted framework to validate emission reductions and removals achieved through voluntary actions.

VCS program scopes; projects mitigating the seven GHGs recognized by the KP, ozone-depleting substances, all the projects supported by methodology developed under VCM program, a methodology approved under other approved GHG program (with exclusions), and, the jurisdictional and nested REDD+ programs. The VCS standard (2023)<sup>6</sup> outlines specific exclusion list of the project activities. The following activities are excluded for project development with some waiver for the LDCs for the most of the activities except for reduction of HFC-23 emissions, which is excluded in all countries.

- Grid-connected electricity generation activities using hydroelectric power plants.
- Grid-connected electricity generation activities using wind, geothermal, or solar photovoltaic (PV) power plants.
- Activities recovering waste heat for combined cycle electricity generation, or to heat/cool via co-generation or tri-generation.
- Activities generating electricity and/or thermal energy for industrial use from the combustion of non-renewable biomass, agro-residue biomass, or forest residue biomass.
- Activities generating electricity and/or thermal energy using fossil fuels, and activities that involve switching from a higher to a lower carbon content fossil fuel.
- Activities replacing electric lighting with more energy-efficient electric lighting, such as the replacement of incandescent electrical bulbs with compact fluorescent lights (CFLs) or light emitting diodes (LEDs).
- Activities installing and/or replacing electricity transmission lines and/or energy-efficient transformers.
- Activities that reduce hydrofluorocarbon-23 (HFC-23) emissions

### 3.2.2 The Gold Standard (GS)

GS, administered by the GS foundation, pioneered a holistic approach towards sustainable development and climate action. Originating in the early 2000s, this standard was conceived through a collaboration between environmental NGOs and experts, striving to establish a comprehensive benchmark for high-quality emission reduction projects. Rooted in the belief that climate action should foster social, environmental, and economic co-benefits, the Gold Standard gained recognition for its rigorous criteria and multifaceted evaluation of projects. Within its framework, diverse initiatives, encompassing renewable energy, household clean cooking solutions, reforestation, and clean safe drinking water provisions. Its genesis was a response to the growing demand for a standard that not only ensured emissions reductions but also prioritized sustainable development.

6 <https://verra.org/wp-content/uploads/2023/08/VCS-Standard-v4.5-updated-11-Dec-2023.pdf>

GS broadly classifies the project it registers into three categories; the community service projects, renewable energy projects, and afforestation/reforestation project. The community services projects provide improved access to services and resources at household, community and institutional levels. Similarly, the renewable energy projects are the ones that supply energy to the national grid while the afforestation/reforestation projects involves plantation in the area that doesn't meet the definition of forest for at least 10 years prior to project start date. **Table 1** presents the GS classified project categories and project types.

**Table 1: Project category and project types as defined by GS7**

Community Service Projects	Renewable Energy Projects	Afforestation/ Reforestation projects
<p>The community support activities include the following:</p> <p><b>Renewable energy</b> connected to mini-grid or off grid solutions including solar, tidal/wave, wind, hydropower, geothermal, waste to energy and renewable biomass.</p> <p><b>End-use energy efficiency</b> reducing energy requirements as compared to baseline scenario without affecting the level and quality of services or products.</p> <p><b>Waste management and handling activities</b> that deliver energy or a usable product with sustainable development benefits such as composting, biogas etc.</p> <p><b>Water, sanitation and hygiene (WASH)</b> activities contributing to climate change mitigation and/or adaptation benefits.</p> <p>Energy projects supplying energy to a national or a regional grid from non-fossil and renewable energy sources such as photovoltaic, tidal/wave, wind, hydro, geothermal, waste to energy and renewable biomass.</p>		<p>This category of project involves plantation in areas that cannot meet the definition of a forest at project start date and shall not have been forest for at least 10 years prior to the project start. The activities include the following:</p> <p><b>Planting trees</b> (also shrubs, palms, and bamboo)</p> <p>Single-species plantations</p> <p>All silvicultural systems including conservation forests (no use of timber), forests with selective harvesting and rotation forestry</p> <p>Agriculture (agroforestry) or pasture (silvopasture) activities.</p>

### 3.2.3 Generic VCM Project Cycle

A generic VCM project cycle follows a usual project development cycle; beginning with a plan and culminating in evaluation (verification and issuance in case of VCM projects). Table 1 highlights the project cycle steps for a VCM project development while **Figure 7** depicts a VCM project ecosystem presenting all the value chain actors in the process.

<sup>7</sup> <https://www.goldstandard.org/resources/faqs>

**Table 2: VCM Project Activity Cycle**

SN	Activities	Description
1)	Plan	Project developers decide for VCM carbon standard and an approved methodology to develop the project activity. Stakeholders are identified and an implementation approach is envisioned. The baseline and feasibility studies may be conducted or initiated during this step.
2)	Design	Project developer prepare project documents as per the applied standard. The documentation must demonstrate that the VCM activity developer has applied the chosen methodologies correctly and met the associated requirements. The design documents shall also contain the excerpt from the stakeholder consultation.
3)	Validate	This step culminates in registration of the project. Project developer will commission an independent body accredited by the respective standard to undertake validation of the project wherein the project's appropriateness to be considered as registered activity under the respective standard is assessed.
4)	Register	Before being registered, validation reports for the project undergo assessment by the standard. If an initiative complies with the rules and criteria specified within the applicable standard, it becomes eligible for registration. Once registered, VCM activities are permitted to commence their implementation phase. The implementation may begin well in advance to this stage as well.
5)	Implement	An activity is implemented as laid out in the documents submitted for registration and validation.
6)	Monitor	Activities are monitored to ensure that emission reductions are generated as described in project or program documents. Project developers create and adhere to a monitoring plan, systematically documenting emission reductions within regular monitoring reports as specified in project documents.
7)	Verify	The periodic monitoring reports of project or program activities undergo scrutiny from a Validation and Verification Body (VVB) as well as the carbon standard associated with the certified activity. Verification stands as a mandatory step for the issuance of credits.
8)	Issuance	Once the governing body of the carbon standard sanctions the issuance of credits, these carbon credits are placed into the project developer's account maintained with the standard's registry. Following issuance, carbon credits become eligible for transfer, retirement, or cancellation.

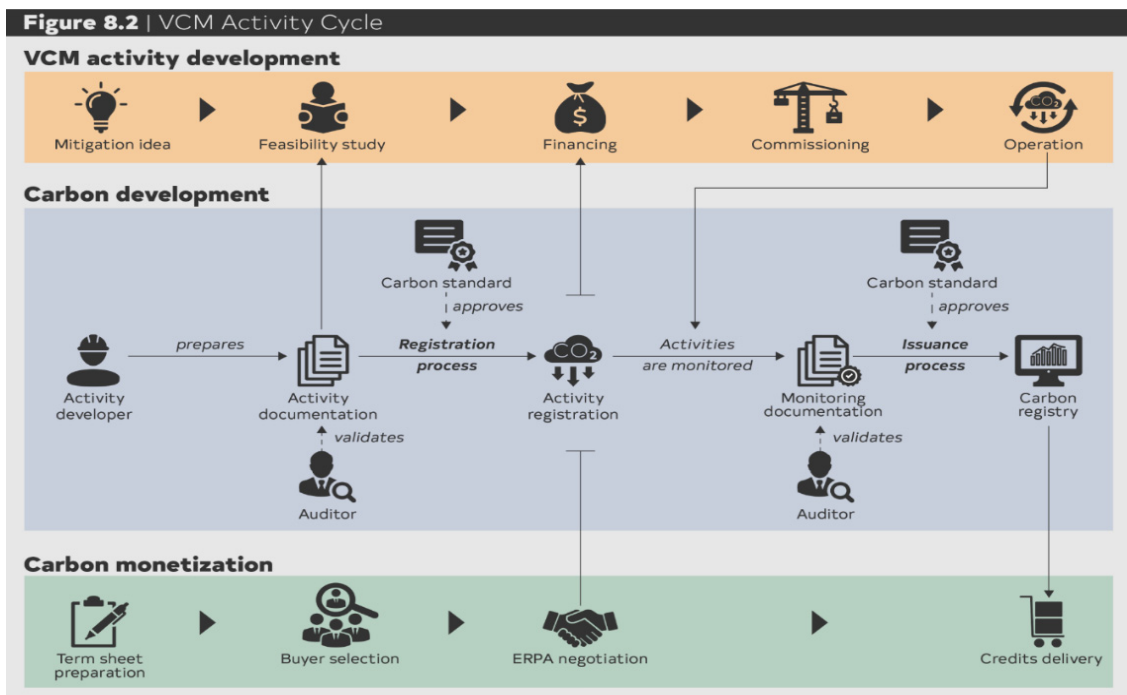


Figure 7: VCM activity cycle

Source: Climate Focus, 2023<sup>8</sup>

### 3.3 Private Sector in VCM

The VCM stands out distinctly due to its independence from government regulations. Here, mitigation initiatives are devised and executed by private entities, certified under specific carbon standards. These initiatives are driven by a diverse array of actors, including for-profit or non-profit organizations, private landowners, Indigenous Peoples or local communities (IPs&LCs), and even subnational or national governments. This is in contrast to regulated carbon crediting programs like CDM, as the latter necessitates project developers to secure approval from a country's Designated National Authority (DNA) for project registration. The VCM's private nature grants it a high degree of flexibility, enabling agility in its operations. The term “*private sector*” implies all non-state actors; the financiers, investors, buyers, intermediates, implementers etc. who are in a way or other connected to market value chain.

In the quest for climate action, the private sector has remained the driving force behind the success and expansion of VCMs. Bolstering commitments with tangible investments, corporations worldwide are actively engaging in VCM initiatives, amplifying the impact on global emission reduction goals. Statistics affirm this pivotal role. A recent publication by Ecosystem Marketplace<sup>9</sup> reports a cumulative value of the VCM reaching 10 billion USD and around 40% of this market size being realized during the first two years of this decade. The scale of operation of the current VCM can be examined with relative sizes of the primary market<sup>10</sup> and the project investment. International Emission Trading Association (IETA) publication<sup>11</sup> reports that the primary markets size of VCM credits has grown five folds (USD 0.3 billion to USD 1.5 billion) from 2020 to 2022. Even interesting is the fact that the investments flowing-in to the new VCM projects in 2022 was five times (USD 7.5 billion) the primary market size.

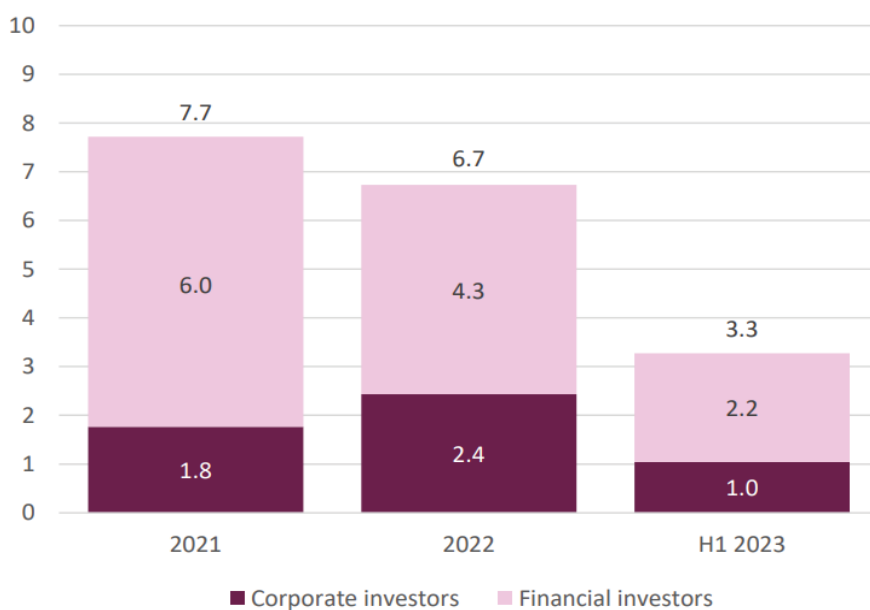
<sup>8</sup> <https://vcprimer.org/chapter-8-how-is-the-voluntary-carbon-market-structured/>

<sup>9</sup> Stephen, D. and Alex, P. (2023): *State of the Voluntary Carbon Markets 2023*, Ecosystem Marketplace, Washington DC, USA.

<sup>10</sup> IETA defines the primary market for carbon credits as the volume of carbon credits retired multiplied by the yearly average price.

<sup>11</sup> Available at <https://trove-research.com/report/global-carbon-credit-investment-report>

The fact on the new investments discussed above is linked to the corporate commitments to invest in and/or purchase the carbon credits. The IETA report on state of VCM reports that around one-third of announced financial commitments to generate or purchase carbon credits are from the corporate sector, supported by 40 - 50 major brands. Moreover, the financial investors outweigh the investment portfolio with two-third of the confirmed investment stakes. **Figure 8** depicts announced capital raised by corporate and financial investors through 2021 to the first half of 2023. This scale of investments raised for VCM projects by corporates and financial investors suggest the scale of the engagement of private sector on VCM wherein the future of VCM can be expected to rest mostly on how private sector fulfill their investment or GHG reduction/offset commitment.



**Figure 8: Announced capital raised by investor type (billion USD)**

Source: IETA, 2023<sup>12</sup>

### 3.4 Nepal: Relative Presence in VCM

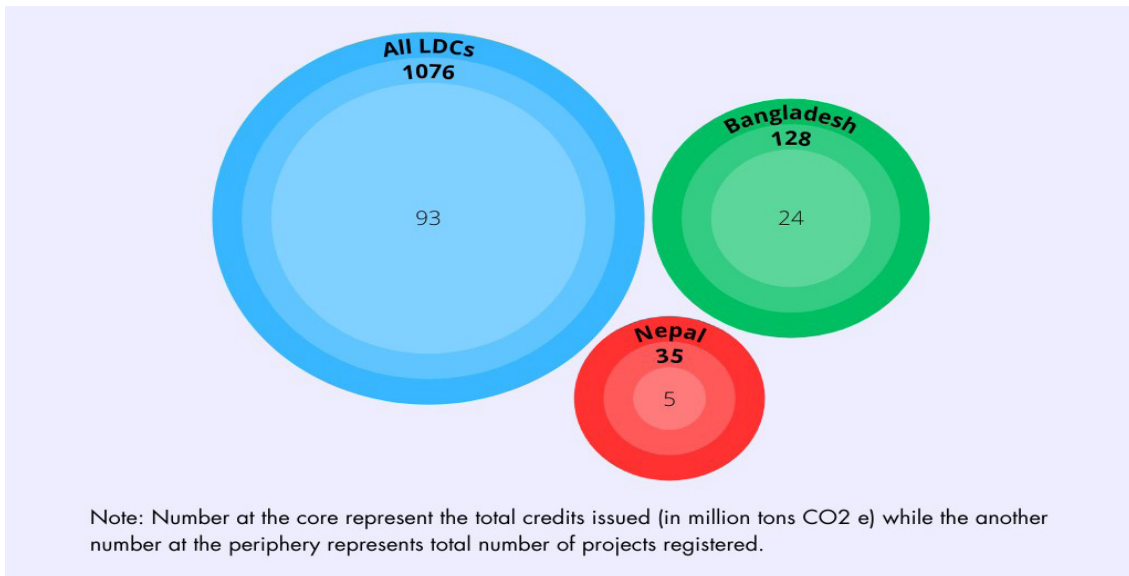
Considering the dominance of VERRA and the GS in project registration and credit issuance and Nepal’s exposure to them, these standards are considered as the prominent carbon standards for further deliberation in this report. Nepal has a total 33 projects<sup>13</sup> registered across major VCM standards. GS remains the most preferred and prominent VCM standards followed by the VERRA. Out of the 33 projects, five are registered as a VCS project while the rest are registered as a GS project. Alternative Energy Promotion Center (AEPC) holds the largest stake of all the projects registered across all VCM standards.

Nepal is a Least Developed Country (LDC) and is eligible for waivers specifically in relation to the additionality requirement, rooted to the CDM principles and embraced by the VCM standards as well. Considering this waiver, Nepal has a privilege satisfying project requirements with a relative ease; access to investment and ability to market credits may however be questionable. Of the entire VCM projects registered, Nepal holds a weightage of 0.72% in terms of the number and 0.29% in terms of the credits

<sup>12</sup> <https://vcprimer.org/chapter-8-how-is-the-voluntary-carbon-market-structured/>

<sup>13</sup> The project also refers to the Programme of Activities. The total number mentioned is based on the unique ID the project is assigned to under each standard.

issued. In order to understand relative position of Nepal in terms of the project registration and credit issuance, a comparative assessment of the available statistics is undertaken with another LDC country in the South Asia region i.e. the Bangladesh. Of the entire LDC portfolio, Nepal represents 3.06% of the projects registered against 11.19% projects from Bangladesh. Similarly, Nepal has 5 million tons of emissions reductions issued to its credit from 35 projects whereas Bangladesh accounts for 24 million tons of emissions reductions from 128 registered projects. Detail of VCM projects registered across different standards including the cumulative emissions reductions achieved and other details is presented in **Annex-3**.



**Figure 9: Comparative presence of Nepal and Bangladesh in VCM**

Considering the total number of projects implemented and the volume of credits issued, virtually there are spaces that Nepal would probably need to work on. However, Bangladesh holds an advantage with the population it has, as well as the country also has promising baseline that builds ground for the projects to come. For instance, the Bangladesh’s dependence on natural gas accounts for 59% of the total commercial energy consumption and 13% of the Bangladeshi are directly benefited from the use of the natural gases that is largely indigenous<sup>14</sup>. Bangladesh hosts seven projects on “*industrial gas*” category and this particular sector contributes to around 9% of the entire emission reductions credits issued for Bangladesh. Interestingly, all these projects pertain to the reduction of gas leakage from the gas distribution network.

Contrast to what prevails at global level, GS projects outnumber the VCS projects in case of VCM project portfolio for Nepal. Both the GS and VCS credits are growing on year-on-year basis with the largest issuances being witnessed by both these standards since 2021, a post-Kyoto period. In case of the projects from Nepal, the peak of the credit issuance was witnessed in 2020 depicting the end-line demand of the Kyoto credits.

<sup>14</sup> EMRD (2023): *Energy Scenario of Bangladesh 2021-2022*, pp. 6, Hydrocarbon Unit, Energy and Mineral Resource Division, Bangladesh

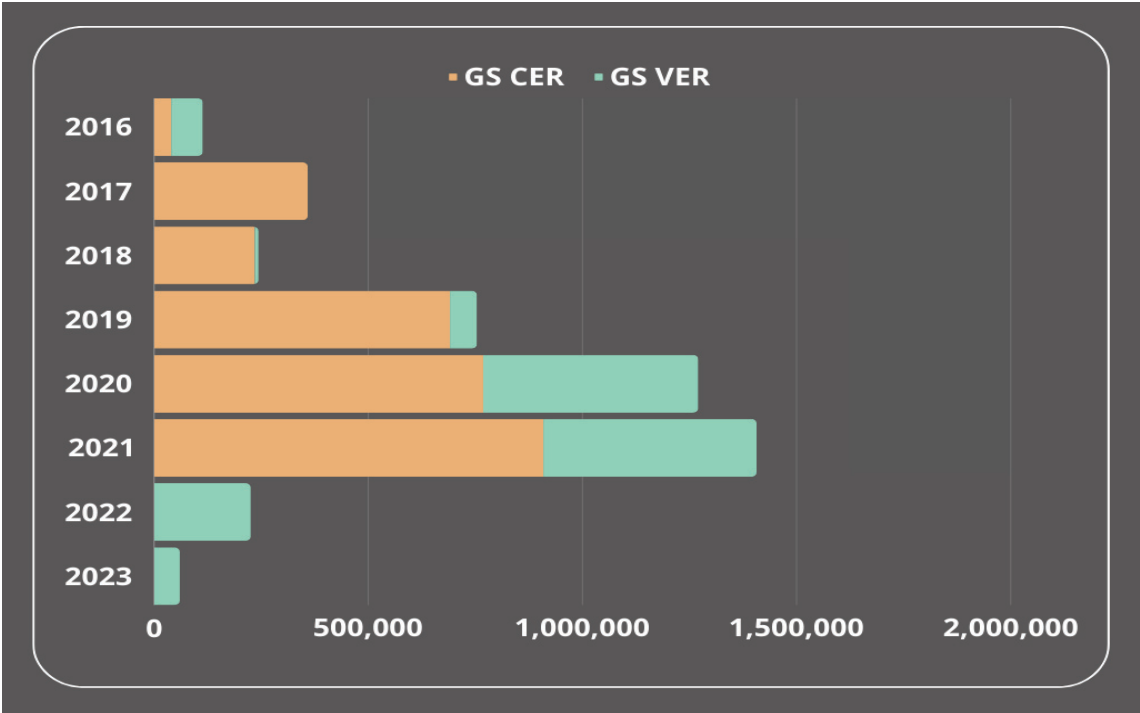


Figure 10: Issuance of GS-CERs and GS-VERs (2016-2023)





# NATIONAL LEGISLATIONS, POLICY & STRATEGY

# 4

## 4.1 Environment Protection Act and Rules

Environment Protection Act (EPA), 2019 has made provisions related to Climate Change in chapter 4. Section 23 requires the Ministry of Forests and Environment (MoFE) unveil adverse impacts and risks due to climate change in the ecosystems and biodiversity followed by periodic assessments. Elements related to the preparation of adaptation plan is comprised in section 24 and the section 26 and 27 respectively makes provision for management of impacts and risks resulting from Climate Change. Matters related to implementation of the Climate Change mitigation activities is included in section 25 and section 28 allows the government participate in carbon trading through the mechanisms established by an international treaty, international government or international agency, commercial entity or private sector.

Chapter 5 of the Environment Protection Rules (EPR), 2020 sets out rules for the participation in carbon trading. Rule 28 authorizes the Government of Nepal (GoN) participate in carbon trading resulting from the reduced emissions from sustainable forests management or increased due to sequestration. Similarly, it also allows any government agency, organization or private sector trade emissions resulting from their respective social or economic activity either through the GoN or through private sector agencies in National or International market. The rule requires project developers obtain Free-Prior-Informed-Consent (FPIC) with the project recipient community. Rule 29 and 30 sets out provisions for the technical committee and the steering committee to evaluate the Clean Development Mechanism (CDM) projects while rule 31 sets out the rules for the entity to work as the Designated National Authority (DNA).

## 4.2 Policies

Climate change policy (2019) is the overarching policy to drive climate change agenda in Nepal. In addition to that the Development Cooperation Policy (2019) and Environment Policy (2019) are also considered as the overarching policy with regards to CDM project/program development in Nepal. This section also reviews various sectoral policies in light with relevance of the respective policy's objectives/activities for developing a CDM or carbon financing project.

Climate change policy, 2019 (CCP) aims, with regards to climate change mitigation, to promote green economy by adopting the concept of low carbon emission development and mobilize national and international financial resources for climate change mitigation and adaptation in just manner. The policy adopts a number of strategies and working policies that are conducive to development of carbon projects. Under agriculture and food security sector, the policy adopts measures to promote water efficient technologies and low carbon emission and energy efficient technologies for production, collection, processing and storage. Under forest, biodiversity and water conservation sector, the policy adopts measures to increase forest carbon sequestration and just distribution of financial benefits received from REDD+ and CDM.

The CCP under water resource and energy sector encourages for production and use of energy efficient technologies. The use of energy efficient technologies and electrical energy are also encouraged for use in industry, transport and physical infrastructure sector. Under the same sector, the policy also encourages use of electrical vehicles. The policy, under Tourism and natural and cultural heritage sector encourages use of renewable energy and energy efficient technologies in tourist spot to materialize the concept of zero emission. The policy strategizes to receive and mobilize financial resources from bi/multilateral international financial mechanism like REDD+, Green Climate Fund, Global Environment Facility, Adaptation Fund, Climate Investment Fund, Carbon Trade etc.

Environment policy (2019) adopts several policy measure for environmental conservation, pollution control, governance etc. The policy measure on sustainable development resonates better with the climate change and carbon financing point of view. The policy adopts working principles like development of bicycle and pedestrian friendly infrastructure in urban areas to reduce carbon emissions. Similarly, the policy also adopts measure to implement necessary provision for the use of electric vehicles.

Development cooperation policy (2019) recognizes environment protection and climate change as one of the domains prioritized for international development cooperation. Aid mobilization modality prioritizes mobilization of development cooperation from established global funds in the area of climate change, among others, through grant assistance. However, the modality preconditions the framework to be prepared for disaster management, environment protection and adaptation and mitigation of climate change prior receiving such cooperation. Similarly, the section under grant assistance within the policy prioritizes sectors contributing environmental protection and climate change for grant assistance to be mobilized.

### 4.3 Strategies

Nepal's Second Nationally Determined Contribution, 2020 (NDC)<sup>15</sup> focuses on implementing mitigation and adaptation actions to advance towards Low Carbon Economic Development. The NDC sets ambitious mitigation targets, aiming for a 42% reduction in greenhouse gas emissions by 2030, conditional upon international support. Nepal intends to increase the share of renewable energy in its energy mix, with specific targets for hydropower, solar, wind, and biogas. The NDC also emphasizes the importance of energy efficiency across sectors like buildings, industries, and transportation. Similarly, through NDC, Nepal commits to reduce deforestation, promote sustainable forest management, and undertake afforestation and reforestation efforts.

To achieve its goals, Nepal highlights the significance of financial support, technology transfer, and capacity-building from the international community. The estimated cost of achieving Nepal's conditional mitigation targets in the Second NDC is USD 25 billion, while the cost of achieving the unconditional targets is estimated at USD 3.4 billion. To meet these targets, Nepal expects financial, technological, and capacity-building support from global funds like the Green Climate Fund, Global Environment Facility, Adaptation Fund, Least Developed Countries Fund, as well as bilateral/multilateral agencies and development funds. Overall, Nepal's Second NDC showcases a strong commitment to addressing climate change through ambitious mitigation targets, renewable energy promotion, energy efficiency, forest conservation, and adaptation actions. Collaboration and support from the global community are deemed essential in achieving these targets and ensuring transparency and accountability in climate action implementation.

<sup>15</sup> GoN (2020), *Second Nationally Determined Contributions*, Government of Nepal Singh Durbar, Kathmandu, Nepal

Nepal's Long-term Strategy for Net-zero Emissions, 2021 (LTS)<sup>16</sup> strives to involve a range of strategies across various sectors to combat climate change and promote sustainable development. One key focus of the LTS is the increased adoption of clean and renewable power sources across all sectors of the economy. This entails not only transitioning to cleaner energy sources but also maximizing energy efficiency in residential, industrial, and transportation sectors, as outlined in the LTS. In terms of transportation, the LTS emphasizes the need to decarbonize the sector through the promotion of alternative modes of transportation, such as electric mass transit and the use of clean fuels.

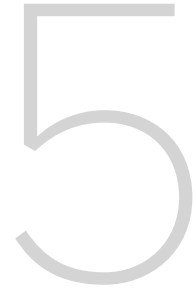
LTS highlights the importance of managing forests and natural resources sustainably to enhance carbon sinks, while promoting sustainable agriculture and land use management to maximize co-benefits. It also underscores the need to improve industrial sustainability through the expansion of the circular economy and the adoption of carbon-neutral technologies, as well as the deployment of carbon removal technologies across all economic sectors. Furthermore, the LTS recognizes and seeks to maximize the benefits of clean energy trade through appropriate mechanisms. Finally, the LTS emphasizes the importance of international cooperation and support for climate actions, aligning the global effort to address climate change and achieve sustainable development goals.

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<sup>16</sup> GoN (2021), *Nepal's Long-term Strategy for Net-zero Emissions*, Government of Nepal, Singh Durbar, Kathmandu, Nepal.



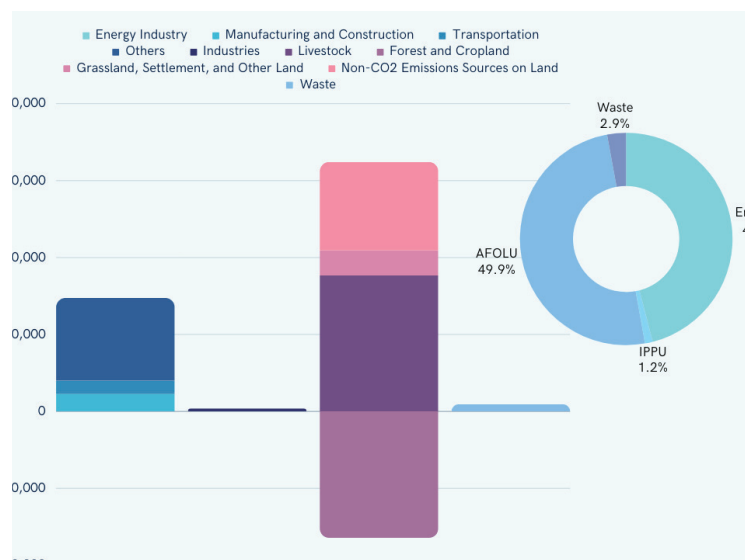
# VCM SECTOR ASSESSMENT FOR NEPAL



Nepal has suitably positioned itself as a recipient country for any potential carbon financing opportunities that may evolve. Through its second NDC, Nepal explicitly establishes conditionality to achieve its NDC targets. The unconditional target corresponds to hydropower development, already a less attractive opportunity for the VCM projects to look into. However, the conditional target lays out opportunities across an array of renewable energy initiatives, energy efficiency, transportation, improving soil organic carbon, afforestation and reforestation initiatives and manure management system. The potential of the NDC targets to translate into viable projects demands screening opportunities in realm of National GHG emission budget established through the National Communications report.

## 5.1 National GHG Budget

Nepal’s Initial National Communication<sup>17</sup> reports GHG inventory for the base year 1994 with emission of 39,265 Gg of CO<sub>2</sub> equivalent. Agriculture sector was the largest contributor (69.2%) followed by Land Use Change & Forestry sector (20.6%) and Energy (7.52%). Second National Communication (SNC)<sup>18</sup> reports a total emission of 13,447 Gg CO<sub>2</sub> equivalent for the base year 2000. The GHG inventory conducted for the SNC reveals that the Agriculture sector remains the largest source category for GHG emission (68.9%) followed by Energy sector (27.8%). The national GHG inventory prepared as part of the Third National Communications (TNC)<sup>19</sup> reports a total GHG emission of 31,998.91 Gg CO<sub>2</sub> equivalent for the base year 2011. Agriculture sector continues to lead the GHG emission source category with share of 49.94% in the total emission followed by Energy sector (45.98%).



**Figure 11: Nepal's GHG emission Scenario from TNC for base year 2011**

<sup>17</sup> <https://unfccc.int/resource/docs/natc/nepnc1.pdf>

<sup>18</sup> <https://unfccc.int/resource/docs/natc/nplnc2.pdf>

<sup>19</sup> [https://unfccc.int/sites/default/files/resource/TNC%20Nepal\\_Final\\_v2.pdf](https://unfccc.int/sites/default/files/resource/TNC%20Nepal_Final_v2.pdf)

For the base year 2011, the total emission of the key GHGs in Nepal was 31,998.91 Gg CO<sub>2</sub> e. Net removal of 7,335.82 Gg of CO<sub>2</sub> (with 5,035.96 Gg CO<sub>2</sub> emissions from the sources and 12,371.79 Gg CO<sub>2</sub> removal by sink) is reported in the GHG inventory for the base year 2011 prepared as part of the TNC. The total Methane (CH<sub>4</sub>) emissions estimated is 1,259.61 Gg with AFOLU sector contributing more than 70% of such emission and almost 80% of CH<sub>4</sub> emission in the AFOLU sector being contributed by enteric fermentation in the livestock. Similarly, AFOLU sector was also the major contributor of the N<sub>2</sub>O emissions sharing 80.5% of the total emissions. Rest of the N<sub>2</sub>O emissions resulted from the energy sector (14.85%) and waste sector (4.65%). Similarly 0.01 Gg of the Hydro-fluorocarbon (HFC) was emitted from Industrial Processes and Product use (IPPU) sector during the base year. Table 3 presents GHG emissions and removals resulting from national GHG inventory for base year 2011.

**Table 3: Summary Table of Nepal's GHG emission and removal 2011 for direct gases**

Sector/Sub-sectors	Emission/Sink of Direct Gas (Gg)				
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFC*	CO <sub>2</sub> -eq
<b>TOTAL</b>	<b>-7335.82</b>	<b>1259.61</b>	<b>26.25</b>	<b>0.01</b>	<b>31998.91</b>
1 Energy	<b>4678.20</b>	<b>354.90</b>	<b>3.90</b>		<b>14713.36</b>
- Energy Industries	2.38	0.00	0.00		2.38
- Manufacturing Industries and Construction	2237.34	0.04	0.06		2256.10
- Transport	1708.92	0.27	0.08		1740.97
- Others (Commercial/Institutional, Residential, Agricultural)	729.58	354.59	3.89		10753.00
2 Industrial Processes and Product Use	<b>355.40</b>		<b>0.00</b>	<b>0.01</b>	<b>379.80</b>
3 AFOLU	<b>-12371.79</b>	<b>882.36</b>	<b>21.12</b>		<b>15982.16</b>
- Livestock		705.49	0.09		17665.29
- Land (Forest and Cropland)	-16436.14				-16436.14
- Land (Grassland, Settlement, and Other Land)	3253.36				3253.36
- Aggregate Sources and Non-CO2 Emissions Sources on Land (3C)	810.99	176.87	21.03		11499.68
4 Waste	<b>2.36</b>	<b>22.35</b>	<b>1.22</b>		<b>923.59</b>
<b>Memo Items</b>					
International Bunker	<b>172.51</b>				
Biomass Combustion for Energy Production	<b>34990.76</b>				

Source: Nepal's Third National Communications Report, 2021

Nepal's VCM portfolio is crowded with "household cooking energy" based projects in form of the biogas and Improved Cooking Stoves (ICS), mostly because of the ease in implementation owing to the small investment size and short project implementation cycle. Although nominal, there is a project on waste management; remaining sectors however remain unexplored. Despite being the largest emitter, the AFOLU sector remains unchecked in terms of VCM project development. The following sections captures the opportunity stemming from the GHG emission scenario established by

TNC but leaving the usual energy projects such biogas and ICS. Potential opportunity window in the AFOLU and the Energy Sector are specifically discussed provided these categories build-up more than 95% of total national GHG emissions budget. An indicative list of projects with approved CDM methodology that may hold potential for development in future is presented in **Annex-4**.

## 5.2 Opportunity Windows

### 5.2.1 AFOLU Sector

The average sales prices of a carbon credit from an agriculture project, with reference to the Ecosystem Marketplace's recent report<sup>20</sup>, stood at USD 11.02 followed by Forestry and Land-use credits with average price of USD 10.14 in 2022. Considering the associated environmental benefits, long-term stability and high permanence of carbon credits issued, project developers, specifically the corporate investors, are lured by the credits from Nature based Solutions (NBS). This is informed by the fact that 80% of the total capital raise (USD 18 billion) between 2021 to the first half of 2023, are for the NBS including the Improved Forest Management (IFM), REDD+ etc<sup>21</sup>. The stats clearly suggest a shift in investment landscape towards NBS indicating the future prospects. Developing projects in improved agriculture practices in rice cultivation, soil carbon enhancement, and agroforestry are better suited for the private sector.

Similarly, an afforestation or reforestation programme implemented as VCM project is likely to attract private investments. While the aggregation of the scattered land parcels may be a challenge for a local private entity, this opportunity may be financed through international corporate investment and implemented by sub-national jurisdictions; the municipalities or the provinces. Nepal's second NDC sets target to maintain 45% of the total area of the country under forest cover by 2030. The current forest cover of Nepal stand at 44.74%. Remaining portion of forestation may still be an attractive investment option for the investors to bank on to secure sustained supply of the carbon credits for future. Since the forestry credits have better permanence, such project is likely to gain a price premium on the credits generated or a generous pre-finance or the both.

In addition to the agriculture and forestry, livestock sector has also not been able to gain required attention for the purpose of development of a carbon project. Historically, livestock has been utilized for energy production by utilizing the dung for the production of biogas. Continuing the same approach of the utilizing livestock manure for biogas production may not be scalable in the changing social context. Meanwhile, livestock rearing is also on transformation; practice of rearing one or two cattle head is slowing down and anyone wishing to rear cattle are going with commercial approach. This shift in rearing cattle from a subsistence to a commercial approach prepares an amicable environment to pursue manure management project under VCM.

### 5.2.2 Energy Sector

Energy sector, specifically the projects targeted to cater household cooking energy technologies, have remained in the forefront of the carbon project development; from the very initial operational days of the CDM. VCM portfolio from Nepal depicts the projects heavy on biogas and improved cooking stoves technologies even today. Meanwhile, with the advent of new methodology on electric cooking and the

<sup>20</sup> Stephen, D. and Alex, P. (2023): *State of the Voluntary Carbon Markets 2023*, Ecosystem Marketplace, Washington DC, USA.

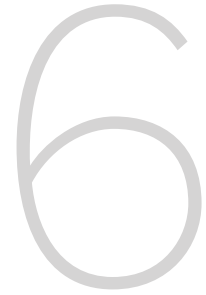
<sup>21</sup> Available at <https://trove-research.com/report/global-carbon-credit-investment-report>

electricity availability being relatively easier compared to a period not too long away, the household cooking is undergoing transformation. As a result, multiple projects are conceived with an aim to finance technology units through the investment secured as part of the VCM project development. Design and implementation of a VCM project on electric cooking may therefore be an easy pick for the private sector accustomed to implementing projects on similar circumstance. Electric cooking will help transform household cooking regime, which is also inevitable to achieve the net zero emissions target by 2045 as envisioned in the LTS as this is only likely with a complete replacement of the LPG as household cooking fuel.

It is a fact to be acknowledged that Nepal has not been able to diversify projects; the carbon projects are type casted to specific technological solutions leaving ample areas to be thought for project development. Considering the clean grid most of the electricity based project opportunities are already ruled out; for example, replacing energy inefficient bulbs, grid connected renewable energy, captive energy from renewable resources to displace grid electricity. This narrows down the choices for the private sector on project development. However, the energy efficiency measures in manufacturing industries, electric mass transportation system, and fuel switch in industries are some of the areas that might be of interest for exploration.



# STAKEHOLDER ROLE IN VCM ENGAGEMENT



## 6.1 VCM in Light of Paris Agreement

VCM involves the engagement of multiple stakeholder; the project developers, standards, validation and verification bodies, investors and credit off-takers. The fundamental nature of the VCM is that it is not regulated by governments. VCM is collective outcome of the various standards governed by their respective governing bodies, usually an international Non-Government Organization (NGO) or a group of NGOs. Such standard setting bodies for the VCM are also scattered across several jurisdictions creating an ununiform governance of the standards depending on the respective jurisdictions they are located at.

The relative distance of the VCM from governments has resulted in a lack of understanding of the VCM by governments and public sector actors—particularly in developing countries, even though most VCM projects are in developing countries. This lack of understanding limits opportunities for the VCM to complement government action on climate change. Used strategically, VCM activities can channel investment into sectors that are not covered by NDCs under the Paris Agreement or other public policies, support Sustainable Development Goals (SDGs) and climate targets in host countries, and accelerate climate action in jurisdictions where legal frameworks are not fully developed.<sup>22</sup>

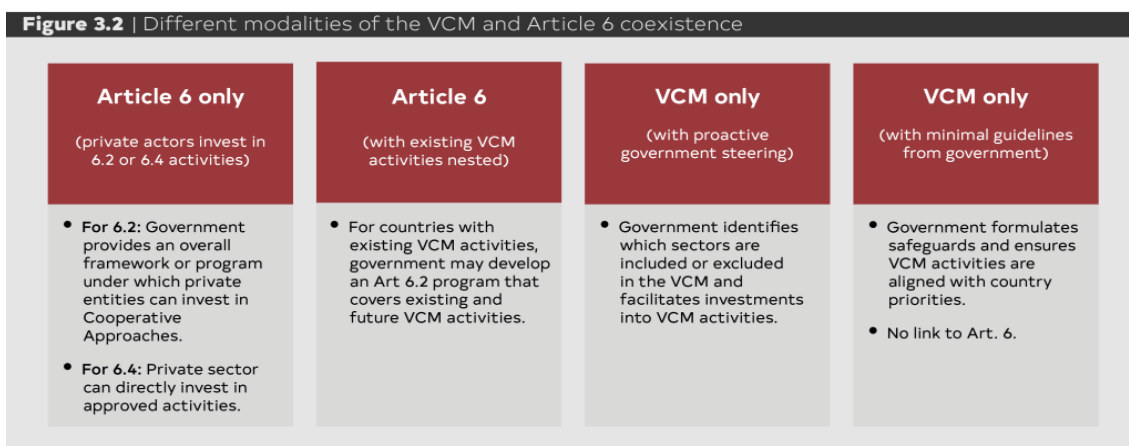
Considering the changing landscape of carbon financing, it is imperative to view VCM under the shades of the Paris Agreement. The Paris Agreement, article 6, puts forward a new avenue to recognize voluntary efforts for climate change mitigation. Moreover, article 6 is accommodative to consolidate scattered voluntary efforts to climate change mitigation across various standards. The article is flexible on allowing the sovereign governments decide on the approaches and methods to reduce GHG emissions on a mutually acceptable manner. This is contained in article 6.2 (Cooperative Approaches) of the Paris Agreement.

Article 6.2 establishes procedures and directions to prevent duplication of GHG emission reductions and removals (called as Mitigation Outcomes (MOs) or Internationally Transferable Mitigation Outcomes (ITMOs) depending on the use of the emission reductions achieved), ensuring that these outcomes aren't counted more than once within various NDCs. Therefore the ITMOs are required to be adjusted across the national registries by deducting a unit from the host country registry and adding a unit in the registry of recipient country. In order to materialize the transfers, the participating countries commitment, by signing a Memorandum of Understanding (MoU) to adjust accounting and ensure smooth transfers.

With the article 6.2 provisions, VCM may exist indifferent to the compliance market envisioned by the Paris Agreement or seek better alignment with the compliance regime. Transactions of mitigation outcomes under Article 6.2 may be authorized—

<sup>22</sup> <https://vcprimer.org/introduction-the-voluntary-carbon-market-explained/>

requiring corresponding adjustments—and then be transacted as ITMOs for use toward NDCs, CORSIA compliance, and OIMP. The participating countries may mutually decide on the proportion of the ITMOs that will be allocated to either parties. Non-authorized credits do not require corresponding adjustments and may be used toward other purposes determined by the host country or the respective buyer. VCM Primer developed by Climate Focus brings-up different modalities of co-existence between VCM and article 6 (see **Figure 12**). Permutation and combination of the modalities VCM and article 6 may coexist defines relevance and intensity of engagement of stakeholder, which are discussed in the sections to follow.

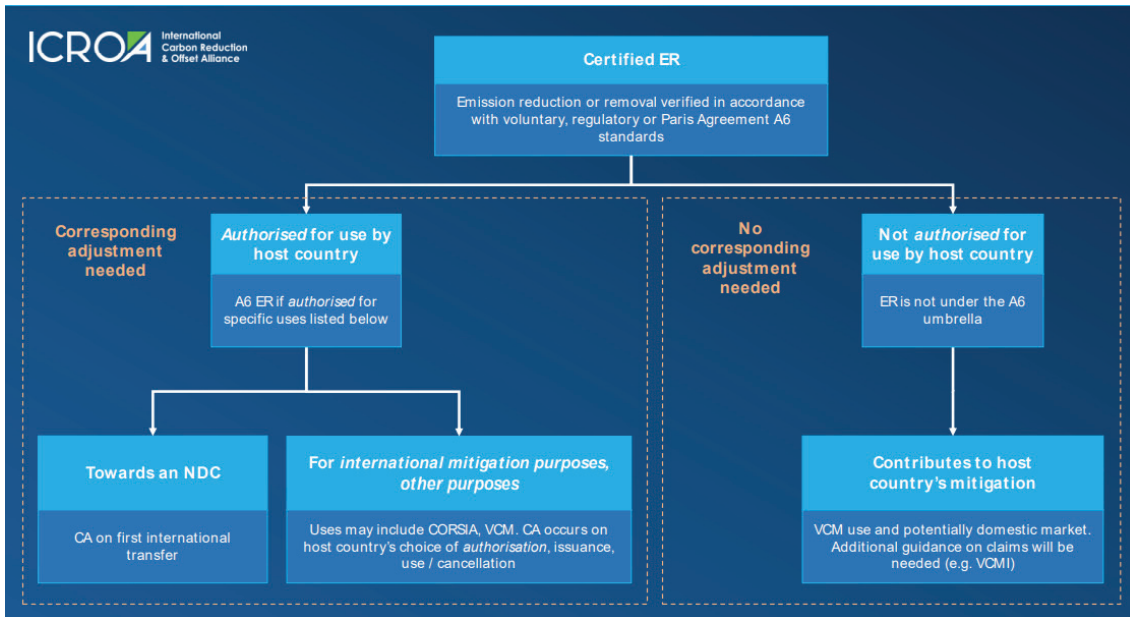


**Figure 12: Different Modalities of the VCM and Article 6 co-existence**

Source: Climate Focus, 2023

## 6.2 Government’s Role in Paris Agreement Led VCM Opportunities

Considering that the Paris Agreement recognizes voluntary actions for the climate action with NDC remaining as the central piece of the entire process, government can act as the playmaker in materializing VCM benefits. Since the role of the government is even more pronounced in context of article 6, understanding their role is important to pave ways for private sector engagement. Considering that the article 6.4 mechanism are yet to be fleshed out and it corresponds to the compliance requirement alike CDM, instating mechanism for article 6.2 projects is deemed as an immediate priority. Setting-up a functional article 6.2 mechanism will contribute to set-up mechanism for article 6.4 projects. Under article 6.2, governments need to facilitate VCM projects setting out the framework outlining the type and nature of projects that will be developed with and without the corresponding adjustments. **Figure 13** presents ways how emissions reductions may be used with or without corresponding adjustments.



**Figure 13: Use of emissions reductions with and without Corresponding Adjustment**

Source: ICROA, 2023<sup>23</sup>

Governments may establish frameworks and safeguards measures to oversee the VCM projects within their jurisdictions. Formulating policies and regulations are instrumental to create a conducive environment to secure VCM investments and promote participation in projects generating carbon credits. Additionally, governments may actively participate in project development themselves. Although private standards govern the VCM, governments have pathways to engage with and derive advantages from it. Their involvement typically occurs in two primary roles: as regulatory authorities in host countries where VCM activities occur and as investors in these activities. Regardless of their role, governments play a crucial role in ensuring stability and clarity for VCM transactions by delineating the guidelines governing VCM involvement. This section aims to present a desired workflow for Nepal government to engage with VCM.

### 6.2.1 Scope

When it comes to the engagement of government in VCM activities, the entire process would interrelate with the implementation and financing of Nepal’s NDC. Recently Nepal government has unveiled the NDC implementation plan wherein the estimated costs to finance the NDC equate to USD 33,048.96 million. Most of the sectors outlined in the NDC implementation plan are conditional upon international funding support from an array of instruments including, among others, the climate and carbon finance. In this context, it is important to assess suitability of the interventions for climate or carbon finance. Specific to carbon financing, a generic VCM project (beyond Paris Agreement) is unlikely to bear higher mitigation costs compared to VCM projects tied-up to the article 6.2 of the Paris Agreement. The climate finance from available resources may have higher appetite for more expensive mitigation actions.

Scoping mitigation commitments laid down in the NDC is therefore the primary point to begin in order to plan an effective NDC financing plan. In order to finance the NDC, it is desirable that the government undertakes resource mapping and resource

<sup>23</sup> ICROA (2021): Article 6 of the Paris Agreement and Implications for the Voluntary Carbon Market, International Carbon Reduction and Offset Alliance, Geneva, Switzerland

needs to identify what segment of NDC implementation plan undergoes financing from the VCM window and/or one of article 6 mechanisms, what will be financed with climate finance and what portion would be presented for the bilateral and multilateral financing. Provided that the NDC implementation plan aims to finance activities that do not essentially entail reductions in the baseline emissions, it is advisable to retain such activities for financing from windows other than the VCM.

Equally important for the government is to take stock of the actions under the VCM activities underway and the activities that have been invested upon<sup>24</sup>. This helps to avoid duplication of resources while securing financial resources for NDC implementation. Moreover, this also enables government understand the types of projects that are readily implementable with an effective VCM. In order to scale-up project financing with VCM, it is advisable that the VCM projects on the ground are recognized by the government. Inviting the existing VCM project developers and implementers to get enrolled in a national database would be an effective way to formalize the VCM projects that are already being implemented.

### 6.2.2 Institutionalize

The ultimate authority to account the emissions reductions and removals generated from a VCM project towards the NDC commitment of a party rests with the host country government. It is therefore important for the government to be explicit in deciding whether or not it intends to account emissions reductions towards its own NDC commitment. For any project investments that are already in place, this dilemma from the host country leads to perceived “**risk of appropriation**” of the carbon credits by the government. It is therefore important for the GoN to facilitate the process by acknowledging VCM projects under implementation or development and explicitly inform project developers about GoN’s intended approach to adjust the emissions reductions.

Being a Party to the Paris Agreement, GoN is obliged to fulfill the commitments made under the agreement. Article 4.13 of the Paris Agreement reads “**Parties shall account for their nationally determined contributions. In accounting for anthropogenic emissions and removals corresponding to their nationally determined contributions, Parties shall promote environmental integrity, transparency, accuracy, completeness, comparability and consistency, and ensure the avoidance of double counting (...)**” thereby emphasizing the avoidance of double counting of the emissions reductions. In order to ensure emission reductions credits are not double counted, each transferred unit shall be deducted from the national registry. This demands GoN to set-up a national registry to keep track of the emission reductions generated in Nepal and precise tracking requires all the projects to be listed in the registry.

In order to facilitate project development and ensure their timely contribution to finance Nepal’s NDC, the GoN would require setting-up an institutional mechanism designating a point of contact for the article 6 related engagement by the private sector. Delay in assigning a Designated National Authority (DNA) for Paris Agreement is the primary step to take to institutionalize the article 6 related processes. Being a national focal ministry for the UNFCCC, Ministry of Forests and Environment (MoFE) is best fit as a DNA to the Paris Agreement. Although the assigning DNA is under the purview of the cabinet, MoFE hold all the right to take proposal to the cabinet for the cause. Moving forward, DNA needs having few key arrangements in place.

<sup>24</sup> The VCM activities that may already have been financed or have been committed to be financed under a VCM project may still be under the radar in the carbon registries. Therefore, taking account of merely the registered project does not provide a complete picture.

A support guide<sup>25</sup> jointly developed by Climate Focus and UNDP recommends a governance framework for article 6.2 implementation and operationalization. The guide recommends having a dedicated oversight body to ensure effective implementation of Article 6, providing long-term guidance and supervision. This body, potentially involving inter-ministerial collaboration, would oversee the development and functionality of processes required for Article 6 implementation. It would receive periodic updates on NDC performance, cooperative approaches, and new opportunities, even leveraging existing climate-focused bodies if available. The guide also recommends an article 6.2 unit that will oversee operational aspects on a daily basis. Its responsibilities span from translating the article 6.2 strategy into detailed mandates, processes, and instructions to allocating tasks and resources to the relevant bodies. This unit, often a ministry department or a distinct government agency, serves as the implementation arm for government policies, ensuring effective execution of article 6.2 activities. Depending on national needs, this competent authority may comprise multiple bodies, with one likely tasked with coordination responsibilities among them.

Having the experience from the CDM, conditional to the case that the DNA function rests with MoFE, the envisioned institutional arrangement discussed above have already been practiced. In order to establish a functional system, expansion of the scope outlined for the CDM project assessment in the EPR (2020) to imply “CDM or other emission trading mechanism” is deemed sufficient to instate the desired institutional set-up to oversee and manage article 6.2 projects. With an existing CDM section leading article 6.2 functions, the ministry may outline requirements for private sector to participate in article 6.2 mechanism. The experience in assessing the sustainable development criteria for the CDM projects submitted to MoFE will be instrumental in putting in place the additional safeguarding other than those included in the EPR.

Defining share-of-proceeds resulting from VCM transactions and defining a fee for enrollment in the GoN’s registry are also crucial elements of the institutional procedure. Operating and maintaining national registry comes with added costs. Moreover, the government should also be equally conscious to raise investments to finance its NDC or secure a portion of the emissions reductions to count towards its committed NDC targets. Setting-up a share-of-proceeds mechanism will enable the government to meet these targets. For example, a defined fee may be introduced to enlist a project and a fee towards adjusting the credits against the corresponding adjustment requirements or a share (say, 5%) towards fulfilling the NDC commitments. Since the participating governments may mutually decide the proportion of the ITMO that will be subscribed to each party, the DNA should be transparent about the respective allocation proportion agreed between parties, if any.

### 6.2.3 Participate

Once the GoN comes-up with a framework for utilizing VCM to finance NDC and the potential sectors for private sector engagement are identified, the government can take lead to participate in VCM projects. Usually some sector may require active participation of the government, specifically the projects that involve land tenure rights such as afforestation, reforestation or REDD+ projects. Government’s engagement may also be required in the sectors that are only triggered through policy reforms or those that already attract heavy public finance. The electric rail network, for example, identified in the NDC could be a sector GoN should participate in inevitably considering the scale of the investments required. Such projects may will not have ample yields

<sup>25</sup> UNDP (2023): *Capacity Building Programme for Article 6.2 Implementation and Operationalization- Support guide for UNDP article 6.2 training course, United Nations Development Programme*

in return to attract private sector investment and a lot of public finance will be drained in such projects. Developing such projects as article 6.2 project will help government contribute to its NDC target, if not financing a part of its investment.

Meanwhile the government should acknowledge their role as the market maker; preparing a conducive policy and regulatory environment therefore shall be the primary role of the government. With the looming discussions around questions of integrity, permanence and over crediting; government's active role in settling the concerns related to the crediting baseline will help establish Nepal as an offset project destination for quality credits resulting in high demand and better prices. Preparation of a **standardized baseline**<sup>26</sup> across a segment (e.g. baseline emissions from brick industries, wastewater management etc.) with DNA's initiative is therefore advisable.

## 6.3 Role of a Private Sector in VCM

### 6.3.1 Functional Role

Private sector is the determinant of the size and scale of the VCM. Private sector influence the VCM in a number of different ways. The entire value chain of the VCM is driven by the non-state actors; right from the standard setting bodies to the end customers who retire the credits against their operations. The demand and supply of the credits involve corporates and businesses from the developed states creating demand and project developers from the developing countries maintaining supply; in between lies the rest of the value chain.

Private sector (including other non-state actors) may assume several roles in the VCM projects value chain. While discussing the private sector it is important to differentiate the private sector on the demand and supply side. Usually the end off-takers are the international private sector while the local private sector assume the roles of the project investors, implementers, project design and monitoring consultants and the intermediaries or the brokers. For the purpose of the rest of the section the "Private Sector" shall be understood for the "Local Private Sector". Various roles that a private sector may take in relation to undertaking of the VCM projects are discussed in **Table 4**.

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<sup>26</sup>Glossary of CDM terms (version 11) define standardized baseline as "A baseline developed for a Party or a group of Parties on a sub-national, national or group-of-countries basis rather than on a project basis, to facilitate the calculation of GHG emission reductions and net anthropogenic GHG removals by sinks and/or the determination of additionality for CDM project activities or PoAs, while providing assistance for assuring environmental integrity."

**Table 4: Functional Roles of Private Sector in VCM Value Chain**

SN	Role	Description	Remarks
1.	Developer	Project developer will be at the center of the project; from raising the funds for project implementation to project cycle management and sales of credits.	Role of project developer is a powerful one but comes with greater challenges. Firstly, if it is a foreign investor, there are underlying guarantees required as collateral against investments made which is challenging. Adding on the risk premium considering various political and economic factors it is likely foreign investments will not be materialized. Secondly, if the investments are to be raised internally, through local investors, there is underlying opportunity cost for the funds that can be lent out to the assets that are more tangible and comes with guaranteed return. Moreover, project would require international transactions (for e.g. validation fees) to be made way before the returns are realized. In such case repatriation of the funds might be challenging.
2.	Investor	Private sector role as an investor would be to raise funds and invest them in the potential projects. Such investment may be raised from the individual or institutional investors. Considering the scale of the investment and the capital at risk, it is advisable that the private sector undertakes investigation on “financial return” of the investments diligently. Such investments are better suited for the banks, of local financial institutions (LFIs), and the impact investors.	The investment by the banks and LFIs on the VCM projects is possible but the likelihood is low. Such investments will be subject to status of the liquidity in the market. Moreover, banks shall comply with the regulator’s policy; hence the investments might be sensitive to change in regulatory policies. In case of LFIs (e.g. the cooperatives) this may be feasible. It is however advisable that LFIs only invest a part of the capital such that the risk on return is minimized.
3.	Implementer	Implementation of VCM projects are best suited for the local private sector, NGOs or other non-state entities. This role demands private sector to maintain and manage the project cycle requirements; such as, undertaking baseline surveys, maintaining the implementation records, stakeholder engagement, undertaking monitoring surveys and managing project logistics.	This role entails virtually no exposure to the investment risks. Moreover, the implementation costs received will maintain the cash flow to the institution. Since there is no exchange risks involved, any foreign currency received does not require repatriation. Depending on the negotiation skills and developers’ consideration, a part of proceeds from the sales of carbon credits may be secured.

SN	Role	Description	Remarks
4.	Validation and Verification Bodies	One of the opportunities a segment of private sector may look upon is the role of “Validation and Verification Body (VVB)”. They are critical in VCM value chain as VVBs are often interface between the applied VCM standard and the project. The integrity council for the voluntary carbon market (ICVCM) emphasizes “robust independent third-party validation and verification” as one of the 10 core carbon principles. <sup>27</sup> They are pivotal in maintaining integrity in each stage of project certification.	The role of the VVB will never be undermined as far as the market continues to exist. VVBs find their roots in one or the other certification scheme (ISO 9000 or 14000 series, forest certification etc.). Provided there are consultants and the auditors for the ISO certification in Nepal, GHG auditing may be an added opportunity for such agencies.
5.	Consultants	There is opportunity for the private sector to come-up as the project consultants. Considering the nature of services entailed consultants working on the environment, energy, climate change, quality certifications, forestry or any broad environmental consulting domain are suited for this role.	The need of a third party engagement is desired by the carbon standards to maintain independence in project monitoring. This is just a desirable function though.
6.	Intermediaries and/or brokers	Private sector may also engage as the project intermediary or the broker. With this role, a private sector will support project developers help find project investment or market the credits issued. Provided that a sound assessment of project is necessary while preparing a business case for the projects, this role may be suited for the consultants as discussed above.	Usually, the projects in Nepal are financed by the international private sector, INGO or a bilateral agency thereby creating a little room for the role of an intermediary or a broker.

In order to ably function as a value chain actor, it is important for the respective actor to understand its role. In case of the local private sector actors, taking-up the role of a project implementer is deemed important. Capital intensive in nature, the VCM projects require a significant investments to make in order to be able to make a business case out of the planned VCM ventures. Staying in the role of project implementer has two-way benefits; firstly, the role doesn’t demand up-front investment and secondly, the project implementer will still contribute to a central piece of the project cycle. For the local private sector on project implementation role, it is advisable that they understand the VCM project cycle and the respective role they can take.

The local private sector may be informed enough to understand the project development requirements and able to assess the potential of a specific intervention to generate emissions reductions. Such ability mostly rests with the consultants that design carbon projects and understand project cycle. It is important for this segment of the private sector to be vigilant on the new developments and investment preferences of the project investors. For instance, the investors were heavily investing

<sup>27</sup> <https://icvcm.org/the-core-carbon-principles/>



in the cookstove project during 2021-2022 which is no longer the case. Currently the investors are seeking for the carbon credits with better permanence, increasing the demand for projects involving the Nature based Solutions (NBS). So, a well thought project on NBS is likely to be financed at better prices in the days to come.

### **6.3.2 Internal Markets**

Setting-up an internal market mechanism for the voluntary carbon credits may be, but with distant probability, an area for private sector to engage with. This section of the report would better suit under the role of the GoN; however, until registry is in place for to effectively register, transfer and retire credits for article 6 projects, the notion of the internal markets is unlikely to function. The economic and fiscal situation of the country doesn't encourage the private sector to consider voluntarily offset their emissions specifically when there are cases of regulatory default against established environmental regulations. Developing an internal markets is therefore ruled out until the economic situation improves with production sector taking the lead. Ultimately the marginal cost of abatement will be imposed on the end-users and this will reduce market competitiveness of a product or a service.

### **6.3.3 Barriers and Risks to the Private Sector**

During the stakeholder consultation, private sector unanimously affirmed few common barriers they have been facing while developing a VCM project. Similarly, there were also few common risks perceived by the private sector. In addition to the stakeholder inputs, this section of the report also outlines few risks from the investors' perspective.

#### **a. Barriers**

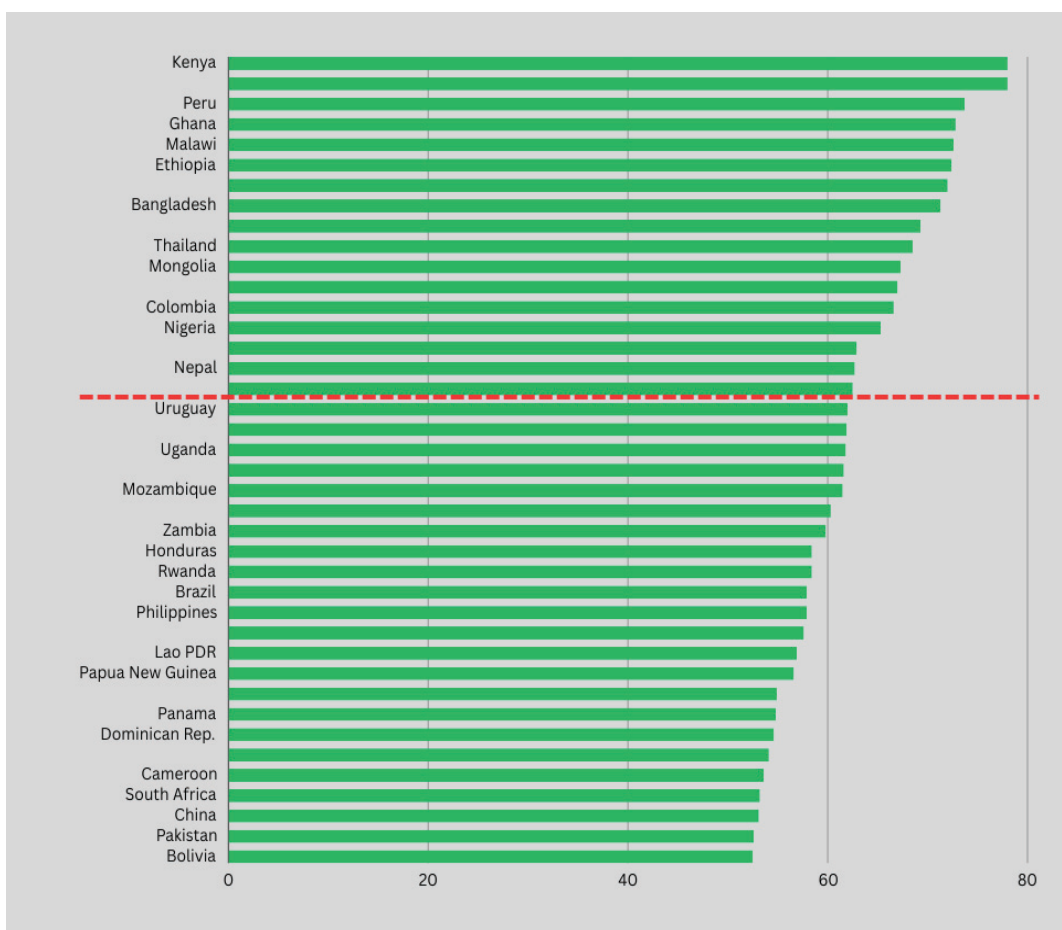
One of the key barriers the project proponents are facing is with regards to the agility of the governance desired for the type of opportunities the private sector intend to bank upon. The lack of DNA in place, hassle in getting the communications acknowledged and state of indecision are few common problems highlighted by the stakeholders that have been interrupting them for the project development. This situation is not new though; an assessment titled "Stocktaking CDM Projects of Nepal" conducted in 2020 reports an average duration of 29 months required to obtain Letter of Approval (LoA) for the CDM projects from the DNA.

Another barrier identified is with regards to the private sector capacity to develop projects. Since the CDM days, the public entities have remained in the forefront of project development but the engagement of private sector has been sporadic with nominal cases to count. Moreover, the technical knowhow to develop carbon projects in the sectors other than energy lacked completely. One of the stakeholders pointed out the need of capacity building across sectors to build a pipeline of all types of potential projects.

More importantly, the stakeholders pointed out knowledge barrier on the end of the government staffs. Contributed by an array of factors such as frequent turnover, multiple roles and lack of focused engagement and opportunity, it is difficult to convince respective desk officer on the urgency and importance of the matter being tabled. This demands for more focused training and capacity building of the relevant government officials so that they are aware of the market dynamics.

## b. Perceived Risks

There is widespread perceived risk related to the policy volatility of the government. The perceived risks contain few inputs interpreted from the stakeholder consultation. It is worth mentioning here that VCM attractiveness index prepared by Abatable<sup>28</sup> ranks Nepal on 16<sup>th</sup> position out of the 40 countries assessed. Nepal's overall score is 62.7 slightly above the average score (i.e. 62.5). The index depicts the gross situation of the developing countries and implies that the situation is equally better and equally worse in other countries.



**Figure 14: VCM attractiveness index**

One of the key risks the private sector stakeholder pointed out was the risk of Government appropriation of the emission reductions credits generated by the project by imposing new regulation that may jeopardize a project that is already implemented. The appropriation refers to accounting a portion of or the entire VCM credits from the projects towards its own NDC attainment through some legal instrument. Therefore, the project developers have high priority on having the government instate a mechanism to acknowledge the projects that have secured investments and already under implementation.

Another key risks the private sector might face is with the risks associated with nullification of the transactions. The export of carbon credit is not yet recognized by the government. This is likely to create a trouble with the project implementers securing payments against the volume of credits issued. Deprived of recognition, such

<sup>28</sup> <https://www.abatable.com/vcm-investment-index/>

transaction may be listed as suspicious transaction in the banking system thereby creating trouble to the project developer.

Overlapping risk or the risk of double counting was also raised by the stakeholders as a prominent risk that might arise. Unless government creates a central repository to report the project progress and project implementation areas, this risk will prevail. Stakeholders therefore want the government to proactively draft a procedure to acknowledge existing projects and list new projects to safeguard the capital poured-in by the investors. Acting to settle this risk is also in compliance with the spirit of the Paris Agreement.



# CONCLUSION AND RECOMMENDATIONS

The VCM has been driven by the private sector since its inception. The market has observed several highs and lows, and each “*crest and trough*” VCM has gone through has been influenced by climate ambition, priorities, and, for obvious reasons, the demand and the supply. Recently the VCM market went on an unprecedented price hike in 2021/22 led by the supply gap created due to no issuances from the CDM projects. Tapping in such opportunities requires a vigilant private sector and the conducive governance. Considering the private sector participation during CDM period and the EPR outlining CDM provisions coming on the last year of Kyoto’s second commitment period implies the agility of both; the private sector and the government. This establishes a need of a capacity to ensure that the VCM nested in article 6.2 don’t turn out to be a wasted opportunity.

Paris Agreement coming into effect, most of the VCM projects are destined to be embedded as article 6.2 project. The NDC also acknowledges the use of carbon financing as a means to finance the NDC targets. With an NDC implementation plan in place, it is high time for the government to scope the NDC targets that would be financed with article 6.2 mechanism with the engagement of private sector. Moreover, the projects that are already underway with the international investors financing the initiatives need to be acknowledged and assured that their right to trade the emissions resulting from the projects will not be undermined.

With the adoption of NDC, Nepal has opened up for its contribution in new areas for mitigation of GHGs. Similarly, the emissions inventory in national communications also provides guidance for the sectors that can be targeted for VCM project development. The assessment has identified opportunity windows in the AFOLU and Energy Projects with an indicative list of projects that may undergo development. The detail assessment of the projects that can really be taken up would require more detailed sector assessment supplemented by more recent data on sources of GHG emissions pertaining to that specific sector. Although it has been accepted for the purpose of preparing national communications, for the purpose of assessment of feasibility of a VCM project in any sector, a decade old set of data would not set-up a workable project.

Considering the flourishing investment climate led by the operationalization of article 6.2 of the Paris Agreement, in order for the private sector to engage in the process, the government holds the responsibility to ease out the process. Any delay in formation of the DNA and laying out procedures to acknowledge VCM projects in national repository will compromise the NDC targets. A big lesson to be taken from the CDM days in Nepal include on how private sector stayed out of the court for the entire operational history when the land neighbors utilized the mechanism as a capital source and means for technology transfer, that too with heavy engagement of private sector.

It is of the priority action that the government instate a mechanism defining the types of projects that would be financed from the window of VCM and/or article 6 mechanism, the ones that would be approached under climate finance and the ones that would go for other bi-lateral and multi-lateral financing. In order to minimize the duplication of resources, there should be a central repository to list the projects that are ongoing implementation and those being planned for implementation. Preparing the interoperable registries are necessitated for using any article 6 instrument. Should the government lack experience

in operating such registries, it is advisable to assign other credible government agency, AEPC for example, to handle the registry function. Since the agency has long experience in handling the CDM and GS registries, it might be an option to consider.

The private sector wishes to safeguard its investment; therefore, a guideline defining the procedure to get enrolled in government's registry and a procedure for the share-of-proceeds or fees are critical. The risk of the appropriation of the credits and transactions being listed as suspicious are some of the valid risks private sector foresees. With all the reasons that prevail for inaction, the government may release a declaration, as an intermediate measure, to console private sector on safety of their investments and that the government will not count any credits from implemented VCM towards the fulfillment of its own NDC targets.

# Annexes

## Annex-1: List of Stakeholders Consulted

Consultant: Mr. Neelam Sharma Rijal, Carbon Market Expert

SN	Stakeholder	Name of Representative
1.	Ajummary Bikas Foundation	Mr. Subarna Kapali
2.	Sustainable Prosperity Initiative	Ms. Sarita Karki Mr. Purushottam Ghimire
3.	Sahas Foundation	Mr. Raju Jati
4.	Alternative Energy Promotion Center	Mr. Nawa Raj Dhakal
5.	Carbon Market Expert	Mr. Prem Kumar Pokhrel

## Annex-2: Stakeholders attending the validation workshop and the summary of discussion

### 1. Participants attending the workshop

SN	Name	Organization	Gender
1.	Julian Chevillard	UNDP	M
2.	Pragyajan Rai	UNDP	M
3.	Ineej Manandhar	UNDP	M
4.	Binita Karki	UNDP	F
5.	Hari Prasad Sharma	MoFE	M
6.	Deepa Oli	MoFE	F
7.	Rojina Sharma	NEF	F
8.	Manjeet Dhakal	Climate Analytics	M
9.	Prabin Kumar Kafle	MNBBL	M
10.	Kuber Mani Nepal	Bikas Renewable	M
11.	Aaditya Agrahari	Ridi Power Co. Ltd.	M
12.	Raju Jati	Sahas Foundation	M
13.	Bishnu Hari Devkota	MoALD	M
14.	Samridhi Pant	SPI Nepal	F
15.	Roshan Bhandari	Urja Developers	M
16.	Suraj Chhetri	Prakriti Consult	M
17.	Bisweta Bajracharya	Prakriti Consult	F
18.	Neelam Sharma Rijal	UNDP Consultant	M
19.	Pratima K.C.	AEPC	F
20.	Shreejan Ram Shrestha	AEPC	M
21.	Bijaya Bahadur Pradhan	Consultant	M
22.	Min Bikram Malla	Practical Action	M
23.	Biraj Gautam	PEEDS	M
24.	Yeonseo Oh	UNDP	F
25.	Babita Adhikari	ABF	F
26.	Bhai Raja	BSP-N	M

27.	Purushottam Ghimire	SPI Nepal	M
28.	Karuna Bajracharya	Clean Cooking Alliance	F
29.	Shubha Shrestha	MoPIT	F
30.	Mohan Das Manandhar	SPI Nepal	M
31.	Ram Sharan Timalsina	Muktinath Krishi Company Ltd.	M
32.	Binod Sharma	Muktinath Climate Care	M
33.	Kushal Gurung	Wind Power Nepal	M
34.	Gyanendra Man	SPI Nepal	M
35.	Nawa Raj Dhakal	AEPC	M
36.	Rassu Manandhar	UNDP	F
37.	Hitman Bohara	UNDP	M



## 2. Representative Feedback

SN	Stakeholder Feedback	Consultant's Response (as relevant)
1.	<p>It is discussed in the presentation that the “government would register projects”, this belittles the role of private sector and questions the relevance of the standards like Gold Standard when government itself involves in registering projects.</p> <p>An autonomous body may be envisioned not only to coordinate but also streamline the private sector efforts in VCM. But when there is engagement of government in the process, it will no longer remain voluntary.</p> <p>The pricing with ITMO may be expected to be high but it is also fair enough with the VCM credits.</p> <p>The agency like UNDP should support GoN prepare a working procedure to recognize VCM project. This is also required to prevent haphazard involvement of people from outside in Nepal's VCM landscape. Capacity development is also imperative for bringing-up auditors and the project developers with thorough understanding of VCM.</p> <p style="text-align: right;"><b>- Mohan Das Manandhar,</b> <i>SPI Nepal</i></p>	<p>With regards to the feedback by Mr. Manandhar, the consultant clarified that a “registry system” proposed to be instated by the government shall not be confused and understood in-lieu for the “project registration” under respective standard. He further clarified that the registry has been proposed to address stakeholder concerns regarding the transparent information about the market actors and prevention of effort duplication.</p>
2.	<p>Specific to the projects for VCM consideration, it is good to know that the AFOLU sector is prioritized as it also contributes to the high amount of GHG emissions. However, the list doesn't contain AWD as the potential project. Rice is cultivated in 1.2 million hectares land in Nepal and it represents largest contributor of GHG emissions and therefore poses the biggest opportunity. So, including this project in the list annexed to report is suggested. Regenerative agriculture and climate smart agriculture should also be included.</p> <p>Specific to the project that Muktinath Krishi Company is implementing, the audit has already been done and the credits are at the verge of issuance. What will be process to get money after issuance? Will we face any hassle from the government in course of getting the money?</p> <p style="text-align: right;"><b>- Ram Sharan Timalsina,</b> <i>Muktinath Krishi Company Limited</i></p>	<p>The consultant acknowledged the suggestion; AWD is included in the potential project list annexed to the report.</p> <p>Specific to the transaction, the consultant, based on his experience with similar case, informed that receiving the payment will be as per the agreement signed between the parties. Once the agreement is evidenced to the Bank, the payment will be released following the normal banking procedure.</p>
3.	<p>Considering that there is a cost involved in the VCM project development, it is advisable to include cost element in the report to inform the private sector of the underlying costs when they think of developing a project.</p> <p style="text-align: right;"><b>- Shreejan Ram Shrestha,</b> <i>AEPC</i></p>	<p>The consultant clarified that since the report aims to explore the overview of the market, the specific cost component were not the scope of the report. Moreover, since the cost factors are subject to change, it is better to leave it to the market rather than being assertive about it.</p>

### Annex-3: VCM projects registered across different standards

#### Gold Standard Projects

Project ID	Project Name	Project Developer Name	SDG	Project Type	Estimated Annual Credits	Program of Activities	CER	VER/VCU
10813	Biogas Support Program, Nepal Activity-4	Alternative Energy Promotion Centre	3,13,7	Biogas – Heat	75307	Standalone	136047	
10812	Biogas Support Program, Nepal Activity-3	Alternative Energy Promotion Centre	3,13,7	Biogas – Heat	74082	Standalone	141370	
10811	Biogas Support Program, Nepal (BSP-Nepal) Activity-2	Alternative Energy Promotion Centre	3,13,7	Biogas – Heat	35357	Standalone	57614	
10810	Biogas Support Program, Nepal (BSP-Nepal) Activity-1	Alternative Energy Promotion Centre	3,13,7	Biogas – Heat	35607	Standalone	67282	
10788	Sustainable Market Development of Improved cooking in rural Nepal by Practical Action	Value Network Venture Advisory Services Pte. Ltd.	3,13,7	Energy Efficiency – Domestic	37390	Standalone		10961
10739	Nepal Biogas Support Program-CPA 10: 10589 digesters	Alternative Energy Promotion Centre	3,13,7	Biogas – Heat	38731	VPA	20793	
7544	Clean Cooking Solutions for Rural Nepal	Value Network Venture Advisory Services Pte. Ltd.	3,13,7,8	Energy Efficiency – Domestic	33724	Standalone		118008
7509	Nepal Biogas Support Program-CPA 9: 17304 digesters	Alternative Energy Promotion Centre	3,13,7	Biogas – Electricity	57134	VPA	92723	
7508	Nepal Biogas Support Program-CPA 8: 19445 digesters	Alternative Energy Promotion Centre	3,13,7	Biogas – Electricity	64565	VPA	184740	
6597	Promoting Clean Cooking Solutions for the Disadvantaged Households in Nepal	Value Network Venture Advisory Services Pte. Ltd.	3,13,7,8	Energy Efficiency – Domestic	21404	Standalone		89850
6212	Promoting Clean Cooking Solutions for the Disadvantaged Households	Value Network Venture Advisory Services Pte. Ltd.	3,13,7,8	Energy Efficiency – Domestic	58376	Standalone		143692
6394	Nepal Biogas Support Program – CPA 7: 18392 digesters	Alternative Energy Promotion Centre	3,13,7	Biogas – Heat	61191	VPA		32496

Project ID	Project Name	Project Developer Name	SDG	Project Type	Estimated Annual Credits	Program of Activities	CER	VER/VCU
6393	Nepal Biogas Support Program – CPA 6: 18504 digesters	Alternative Energy Promotion Centre	3,13,7	Biogas – Heat	61565	VPA		25504
3566	Nepal Biogas Support Program – CPA 5: 19842 digesters	Alternative Energy Promotion Centre	3,13,7	Biogas – Heat	65883	VPA	237099	
3116	Nepal Biogas Support Program – CPA 4: 19970 digesters	Alternative Energy Promotion Centre	3,13,7	Biogas – Heat	66397	VPA	385385	
3114	Nepal Biogas Support Program – CPA 3: 19959 digesters	Alternative Energy Promotion Centre	3,13,7	Biogas – Heat	66329	VPA	380223	
3109	Nepal Biogas Support Program – CPA 1: 20000 digesters	Alternative Energy Promotion Centre	3,13,7	Biogas – Heat	61510	VPA	436946	
3113	Nepal Biogas Support Program – CPA 2: 19927 digesters	Alternative Energy Promotion Centre	3,13,7	Biogas – Heat	66236	VPA	400896	
756	Efficient Fuel Wood Cooking Stoves Project in Foothills and Plains of Central Region of Nepal	Egluro	3,13,15	Energy Efficiency – Domestic	24541	Standalone	39672	
504	*WWF Nepal Gold Standard Biogas Voluntary Emission Reduction (VER) Project	BSP-N	3,12,1,4,13,7,8	Biogas – Heat	21088	Standalone		753754
4265	WWF Biogas Nepal II	BSP-N	3,12,1,4,13,7,8	Biogas – Heat	88196	Standalone		278105
3018	Improved Cook Stove Project with Carbon Finance (ICF) Nepal	Eneco Energy Trade B.V.	3,13,15	Energy Efficiency – Domestic	6570	Standalone		27096
1229	Organic waste composting in Kathmandu Valley	myclimate Foundation	13,17,11,8	Other	2949	Standalone		13428
1191	Smokeless Cook Stoves for Rural Districts of Nepal	Die Ofenmacher e.V.	3,13,5,7	Energy Efficiency – Domestic	8160	Standalone		45972

## VCS Projects

Project ID	Project Name	Project Developer Name	SDG	Project Type	Estimated Annual Credits	Program of Activities	VCU
2357	Improved cook stove market development in rural Nepal	Practical Action	13	Energy demand	44763	Standalone	101747
2303	Energy Efficient Cooking Solution for low emission development in Nepal-2	Environment Protection Centre (EPC)	13	Energy industries (renewable/non-renewable sources)	33672	Standalone	109844
1863	ENERGY EFFICIENCY COOK STOVE IMPLEMENTATION IN NEPAL	Enen Green Services Private Limited	13	Energy demand	56811	Standalone	37557

#### Annex-4: List of Potential Projects for VCM Consideration

SN	Sector	Applicable Methodology <sup>29</sup>	Baseline Scenario	Project Scenario
1	Agriculture: Methane emission reduction from feed stock improvement in dairy cattle	AMS-III.BK.	High specific methane emission per unit of milk production due to the poor nutritional conditions of lactating animals in the baseline.	Reduced specific methane emission per unit of milk production due to improved nutritional conditions of lactating animals in the project.
2	Agriculture: Substitution of Nitrogen fertilizers by rhizobacteria inoculant.	AMS-III.A.	Production and use of synthetic nitrogen fertilizer results in GHG emissions.	Use of legume-rhizobia bacteria (inoculant) substitutes/reduces the use of synthetic nitrogen fertilizer reducing GHG emissions in the fertilizer production process.
3	Agriculture: Methane emission reduction by adjusted water management practice in rice cultivation.	AMS-III.AU.	Generation of methane due to anaerobic decomposition of organic matter in rice cropping soils.	Methane emission avoidance, for example, by changing the water regime during the cultivation period from continuously to intermittent flooded conditions and/or a shortened period of flooded conditions.
4	Energy: Charcoal production and consumption	AMS-III.BG.	Production of charcoal by using non-renewable and renewable biomass.	Production of charcoal by using renewable biomass in a more efficient way.
5	Energy and Transportation: Plant oil production for transportation application.	AMS-III.T.	Petrodiesel would be used in the transportation applications.	Oil crops are cultivated, plant oil is produced and used in the transportation applications displacing petrodiesel.
6	Transport: Introduction of electric and hybrid vehicles	AMS-III.C.	Operation of more-GHG-emitting vehicles for providing passenger and/or freight transportation services.	Operation of less-GHG-emitting vehicles with electric/hybrid engines for providing passenger and/or freight transportation services.
7	Energy and Transportation: Production of biodiesel for transportation application.	AMS-I.H.	Services (e.g. electricity, thermal and mechanical energy supply) are provided using fossil fuel based technologies.	Biofuel is produced from biomass residues, cultivated biomass or from waste oil/fat and used for the generation of electricity, thermal or mechanical energy displacing fossil fuel.
8	Waste: Methane emission avoidance by excavating and composting partially decomposed waste from landfill	AMS-III.AF.	MSW is left to decay within the SWDS and methane is emitted into the atmosphere.	Methane emissions will be avoided by applying pre-aeration and excavation of existing SWDS, followed by separation and composting of non-inert materials.
9	Waste: Landfill Methane Recovery	AMS-III.G.	Biomass and other organic matter in waste are left to decay and methane is emitted into the atmosphere.	Methane in the landfill gas is captured and destroyed or used. In case of energetic use of landfill gas, displacement of more-GHG-intensive energy generation.
10	Waste: Composting biodegradable solid waste	AMS-III.F.	Biomass and other organic matter (including manure where applicable) are left to decay and methane is emitted into the atmosphere.	Methane emissions are avoided through composting.
11	Forestry: Afforestation and reforestation activities implemented on lands other than wetlands	AR-AMS0007	Any lands other than wetlands and no forest stands on the lands.	Forests are planted on lands.

<sup>29</sup> <https://cdm.unfccc.int/methodologies/SSCmethodologies/approved> and <https://cdm.unfccc.int/methodologies/SSCAR/approved> for forestry project



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