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MARKET RESEARCH ON POSITIONING ARBONAUT IN THE
SUPPLY CHAIN OF VOLUNTARY FOREST EMISSION TRADING

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Market Research on Positioning Arbonaut in The Supply Chain of Voluntary Forest
Emission Trading

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Abstract

Forest emission trading – offsetting carbon footprints through financing forest protection or planting activities – in theory create a positive outlook on additional reduction of greenhouse gas emissions. The concept in practice however is risky and complex, and therefore should be implemented with thorough understanding.

The thesis aims at delivering a coherent explanation of the concept of voluntary forest emission trading to Arbonaut, which is interested in becoming a market player. Consequently, the thesis will position Arbonaut in the supply chain through: (1) nominate possible market entry strategies, (2) analysis of the nominees, and (3) complementary data of potential competitors and clients.

Both primary and secondary data was collected for this study, including an interview, first-hand experience from direct collaboration with the commissioner, and literature. To conclude the study, recommendations on market entry pathways and the corresponding preparations are given.

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emission trading, offsetting, carbon credits, forestry, market research

Contents

1	INTRODUCTION	4
2	LITERATURE REVIEW	5
2.1	Emission reduction mechanisms: Cap-and-trade and baseline-and-credit	5
2.2	Emission reduction market: Compliance and voluntary	6
2.3	Forest carbon market profitability.....	9
2.4	Voluntary forest carbon market.....	12
2.5	The supply chain of a forest carbon project	16
3	FINDING AIM AND OBJECTIVES	26
4	MATERIALS AND METHODS	26
5	RESULTS	27
5.1	SWOT analysis	27
5.2	Benchmark analysis of existing competitors	35
5.3	Thematic interview	39
6	INTERPRETATION.....	41
7	CONCLUSION	43
	REFERENCES	44

APPENDICES

Appendix 1 Project development cycles of the nominated voluntary carbon standards

Appendix 2 Interview questions for South Pole

1 INTRODUCTION

The thesis is a market research on positioning Arbonaut on the supply chain of forest emission trading.

Emission trading, specifically forest emission trading, is on the rise in a global attempt to tackle global warming. The planet is likely to be 1.5°C warmer above pre-industrial level between 2030 and 2052. This is defined as the tipping point of climate change, if exceeded shall cause irreversible damage to the marine lives and coral reef ecosystems. (IPCC 2018, 6, 10.)

Emission trading, while initiated under the Kyoto Protocol, however, received inadequate attention. The concept found its demand from the private sector in the voluntary market, and was recognised and encouraged under Article 5 and 6 of the Paris Agreement thereafter.

The thesis will explain the concept, its core stakeholders and evolution through a compilation of existing literature. Once the concept is thoroughly explained theoretically, potential roles for Arbonaut in the market will be identified. The layout of the study, therefore, answers accordingly to the following three main questions:

- “What is forest emission trading?” to explain the concept through literature review
- “Why should Arbonaut enter forest emission trading?” to display the profitability of the market
- “How can Arbonaut enter forest emission trading?” to develop an entry strategy to the market

Arbonaut, the commissioner of this thesis, is a technology provider for natural resource management. The company is a long-term supplier of forest inventory

services, which extends its portfolio to REDD+ technical assistance and consultancy. Acknowledged the increasing occurrence of forest emission trading, and a compatible capacity, Arbonaut saw an opportunity for market expansion in this market. The objective the company set for this study is to deliver an overview of the forest carbon market and its current situation, and from there, a suggestion of market penetration activities.

2 LITERATURE REVIEW

2.1 Emission reduction mechanisms: Cap-and-trade and baseline-and-credit

Emission reduction can be achieved through two mechanisms: cap-and-trade and baseline-and-credit. The former reduces emissions through establishing a limit; the latter reduces emission through creating more sequestration ability.

In cap-and-trade system, a binding total emission limit (a “cap”) is set under regional, national or international legislations. All parties involved are then allocated an amount of emission “allowances” accordingly. A cap-and-trade network is also called an Emission Trading Scheme (ETS). To not exceed their emission quota, companies can either: reduce their greenhouse gas (GHG) emissions; and/or trade allowances with those who have a surplus; and/or buy carbon credits from associated baseline-and-credit programs.

In baseline-and-credit system, also called project-based, individuals and companies can reimburse their emissions by paying for emission reduction activities in other countries. This action is called “offset”. Emission reductions, or carbon credits, are generated through carbon projects whose activities are to sequester carbon and increase carbon storage. These carbon credits are then traded and purchased.

The reason for the name baseline-and-credit is that projects are required to establish a *baseline* scenario. The scenario describes the situation if the project does not happen. Emission reductions differences measured are "*credited*" as the project's carbon credits.

Projects can contribute to emission reductions through: (i) conversion of non-forested areas into forested lands – Afforestation and Reforestation (AR); (ii) prevention of forest loss or deterioration – Reduced Emissions from Deforestation and Degradation (REDD); (iii) enhancement of carbon storage in existing forests through sustainable forest management – Improved Forest Management (IFM) (Olander & Ebeling 2011, 5-7).

2.2 Emission reduction market: Compliance and voluntary

2.2.1 Compliance market

In the compliance market, countries face mandatory emission reduction targets, such as the Kyoto Protocol and the Paris Agreement.

Kyoto Protocol

The Kyoto Protocol, signed in 1997 and came into force in 2005, aimed to reduce anthropogenic GHG emissions in correlation with national capability in making the reductions. The responsibility is placed on developed countries due to their economic progress playing a significant role in contribution of global GHG emissions. (United Nations 1998, 2-3.)

Under the Protocol, there are three "flexibility mechanisms" for the committed parties in tackling GHG reductions: Emission trading; Joint Implementation (JI); Clean Development Mechanism (CDM) (Article 17, 6 & 12). Emission trading is a

form of cap-and-trade, with two associated baseline-and-credit sources JI and CDM.

Developed countries participating in emission trading under the Kyoto Protocol are restricted to specified total emission allowances called assigned amount units (AAUs). One AAUs is equal to one tonne of carbon dioxide equivalent (tCO₂e).

Most cap-and-trade schemes operate in compliance markets, as their emission limits are binding and imposed by legislative authorities. At the moment, the European Emission Trading Scheme (EU ETS) is the largest trading scheme in the world, covering 45% of the EU's emissions and 75% of international carbon trading (European Commission 2019). In December 2017, China launched its own ETS, initially expected to cover more than three billion tonnes of CO₂ from the power sector. This has set China ETS to overtake its EU counterpart. (ICAP 2018, 35, 67.)

JI facilitates reducing GHG emissions in developed nations, so-called Annex I countries. Carbon credits produced from JI projects are called emission reduction units (ERUs). CDM was designed exclusively for carbon projects in developing economies, or non-Annex I countries. CDM only approves forest carbon credits from AR projects (United Nations 2002, Decision 17/CP.7). CDM offsets for reduction projects (REDD) are called certified emission reductions (CERs). Offsets generated by removal (AR) are categorised into temporary CERs (tCERs) and long-term CERs (ICERs). One carbon credit is equal to one tonne of carbon dioxide equivalent (tCO₂e). (United Nations 1998, 6-7, 11-12, 15.)

$$1 \text{ CER} = 1 \text{ tCO}_2\text{e}$$

Paris Agreement

The Paris Agreement calls for a global attempt in halting global warming below 2°C above the pre-industrial baseline, and more critically, restricting it from passing the 1.5°C increase over this reference threshold. The international

agreement was developed under UNFCCC and to be implemented in 2020. (United Nations 2015, 3.)

Acknowledging the potential of forestry in climate change mitigation, the Paris Agreement dedicated Article 5 to facilitate the role of forestry sector, more specifically from REDD and IFM activities, in reducing GHG emissions (United Nations 2015, 6). These are the sectors excluded from the previous climate change agreement, under CDM of the Kyoto Protocol.

It is believed that land use and forestry sector will have an increasing role in climate change mitigation under the Paris Agreement, and turn forests from a net source to a net sink of carbon in ten years' times (Climate Focus 2015 & Grassi & Dentener 2015 cited in Gaast, Sikkema and Vohrer 2018). Constant efforts in renewal and refinement of carbon accounting methodologies also equip forest programs, especially REDD and IFM, to fulfil the rigorous demands for credibility to enter the compliance markets (Gaast et al. 2018, 46).

2.2.2 Voluntary market

Voluntary market operates independently from climate change legislation. Voluntary offsetting is supplied by projects in unregulated sectors or not eligible for mandatory markets; and demanded by the private organisation with the aim at positioning themselves as corporate goodwill leaders, fulfilling emission targets, and/or engaging consumers in the course of sustainability (Hamrick & Goldstein 2016, 22).

The voluntary market emerged to offer compensating opportunities for forest programs excluded from CDM, such as REDD and IFM. Different voluntary standards pursue different roles. Some provide support for small-scale farmers who cannot afford the administrative and development costs of such projects (Plan Vivo); others present an innovative testing ground by imposing less constraints on carbon accounting methodologies (Verified Carbon Standard). (Kollmuss, Zink and Polycarp 2008, 12-14.)

In 2015, the private sector financed 98% of total carbon profits in the voluntary market (25.2 MtCO₂e at €121M). The five main buyer groups, who purchased more than 75% of total offsets, are Events/Entertainment, Service Provider, Energy, Transportation and Financial/Insurance. 76% of the credits reached final consumers directly, and 24% were sold through intermediaries. Only 8% of the buyers are new entrants, while 92% are repeated clients. Land use and forestry credit is within the top three most traded offset categories in Asia (31% of total transaction), Latin America (68%), and Europe (6%). (Hamrick & Goldstein 2016, 21-22, 26-31.)

2.3 Forest carbon market profitability

The outlook for forest carbon projects mid- and post- the Kyoto Protocol is not promising. By 2019, only three forest projects were recorded under JI; and 71 AR projects under the CDM, out of a total of 8368 projects (UNEP DTU Partnership 2019). Initial reasons for this limitation were delays in defining rules and guidelines for Land Use and Forestry industry by two years compared to other sectors (Chenost, Gardette, Demenois, Grondard, Perrier and Wemaëre 2010, 30-31). Currently, the EU ETS does not accept forest carbon offsets, and mostly focuses on the energy sector (European Commission 2004, 4; European Union 2015, 18-19).

Additional issues lay within the nature of forest offsetting. Forestry programs, especially AR, have a long lifespan; hence make a risky investment with long-yielded visible results. For a forest baseline-and-credit project to be validated, it is mandatory to prove that the proposed activities will not happen without accompanying offsets. This is called *additionality*. Furthermore, the carbon sequestered in forest carbon pools (aboveground biomass, belowground biomass and soil) are not *permanent*; they will be released into the atmosphere in the event of fires, logging or diseases. Moreover, as the livelihood of local communities nearby is dependent on wood and non-wood products, forest

conservation for a carbon project can potentially lead to exploitation somewhere else, occurring the issues of *leakage*. (Gaast et al. 2018, 43-44.)

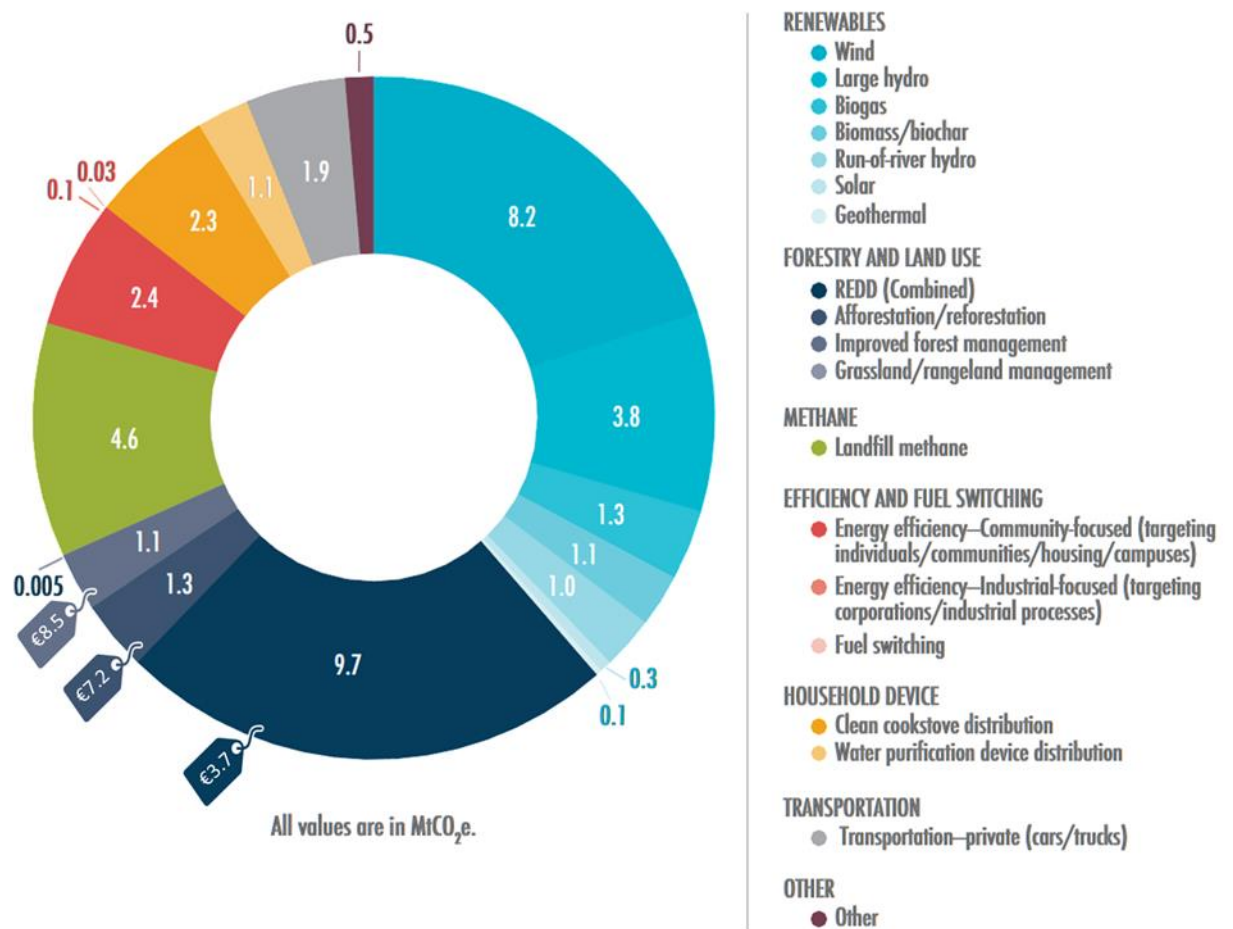


Figure 1. Transacted Volume and Average Price by Project Type, 2016 (Source: Hamrick & Gallant 2017, 12).

In contrast, forest programs play a key role in the voluntary scheme. In 2016, Land Use and Forestry offsets were worth €60.3M in cumulative value (13.1 MtCO₂e sold at an average price of €4.6/tCO₂e) – making it the most valuable industry of the market. This significant difference is thanks to no restriction on project activities, compared to CDM who limits to AR projects. Offsets generated from REDD activities were the most transacted, accounting for almost 24% of total traded volume. IFM offsets, even though low in quantity issued, were sold at €8.5/tCO₂e – highest price of all sectors. (Hamrick & Gallant 2017, 10-12.)

Table 1. The advantages and disadvantages of compliance and voluntary markets.

	Pros	Cons
Compliance market	<ul style="list-style-type: none"> • Transparent and credible carbon credits thanks to well-established guidelines, procedures and methodology. 	<ul style="list-style-type: none"> • Complicated administrative procedures for validation and verification. <p>Forest carbon projects:</p> <ul style="list-style-type: none"> • Limited to AR activities. • Slow development sectors: Primary focus of the compliance market is on the energy sector.
Voluntary market	<ul style="list-style-type: none"> • Lower transaction costs than compliance markets. • Serve as a niche for micro projects too small for the administrative burdens or projects not covered under compliance markets. <p>Forest carbon projects:</p> <ul style="list-style-type: none"> • Accept all forestry carbon projects. • Dominant sector – Positive situation and outlook on both market share and selling price 	<ul style="list-style-type: none"> • Overlapping share with compliance market: CERs can be sold into voluntary market, but not vice versa. • Lower prices than compliance markets due to lack of quality control.

2.4 Voluntary forest carbon market

The thesis will focus on analysis of the voluntary sector for various reasons. Firstly, the implementation period of the Kyoto Protocol ended, and there has not been a concrete action plan for the Paris Agreement. Secondly, forestry sector, although given recognition in the Paris Agreement, is still not in the main focus. Member countries are “encouraged” to consider REDD a leading role in climate change, nevertheless it is not clear how this should be integrated in their national strategies. Thirdly, forestry holds a growing and stable share in the voluntary market, and is presented with a diverse playground in terms of both demand and support.

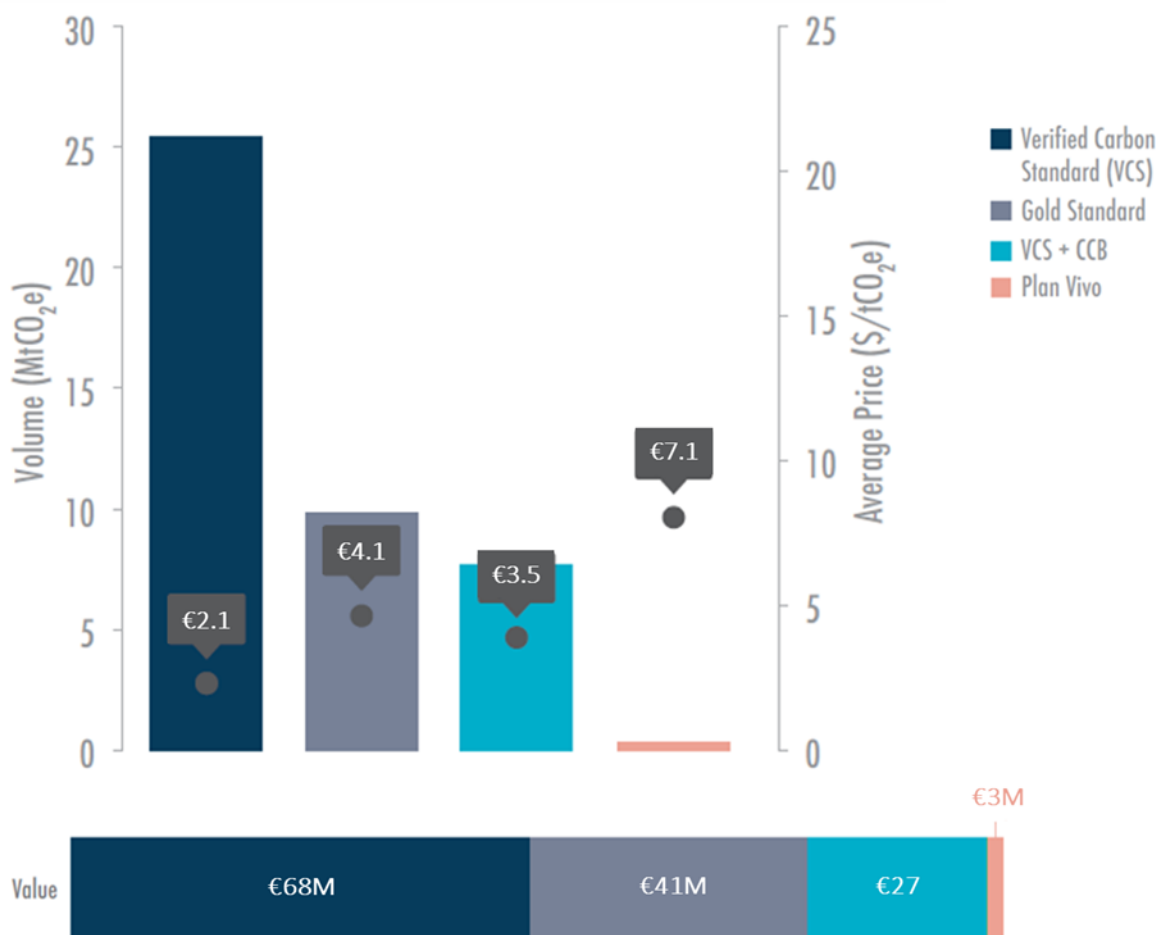


Figure 2. Market Volume and Value by Standard, all sectors, 2016 (Source: Hamrick & Gallant 2017, 16).

The voluntary schemes chosen for evaluation are Verified Carbon Standard (VCS), Climate Community & Biodiversity Standards (CCBS), Gold Standard and Plan Vivo. In 2016, the former three altogether certified 75% of total offsets transacted in the voluntary market, with VCS and CCBS accounting for 58% and Gold Standard for 17%. Plan Vivo, although issued 0.8% total number of credits, were chosen because it solely focuses on land use and forestry projects, especially those carried out by small-scale farmers. Moreover, Plan Vivo-certified credits were sold at €7.1/tCO₂e – almost fourfold the price of VCS offsets. (Hamrick & Gallant 2017, 15.)

Verified Carbon Standard (VCS)

VCS is developed by Verra, a non-profit organisation specialised in framework development for assessment of climate change mitigation and adaptation projects. VCS is the largest voluntary carbon standard, having 1400 projects registered with an accumulated emission removal and reduction of more than 260 MtCO₂e worldwide. (Verra 2018.) VCS is a Full-fledged Standard, meaning it has fully developed requirements for all three criteria: Accounting; Monitoring, Verification and Certification; and Registration and Enforcement (Kollmuss et al. 2008, 48).

Forest offset programs fall under VCS Agriculture, Forestry and Other Land Use (AFOLU). Eligible forest-related activities comprise:

- Afforestation, Reforestation and Revegetation (ARR): Beside AR activities, VCS allows revegetation – improvement of carbon stock in woody plants.
- REDD: Under VCS AFOLU, REDD covers prevention of anticipated deforestation and unanticipated deforestation and degradation. Corresponding action of foreseen degradation is under IFM.

- IFM: IFM refers to activities to increase carbon stock in forests established for timber harvesting which were under poor forest management practices. Projects can contribute to IFM by adopting logging methods resulting in less tree damages, halting logging for forest regeneration, extending rotation cycle to mature age instead of optimal timber value, increasing growth rates and density of existing forests.

VCS has three categories of land-use projects. Agricultural Land Management (ALM) increases carbon sequestration in biomass levels. Avoided Conversion of Grasslands and Shrublands (ACoGS) prevents negative impacts on vegetation and soil in the stated areas or land-use change into lower-density of carbon. Wetlands Restoration and Conservation (WRC) assures moisture level in wetlands. (VCS 2017, 16-30.)

In addition, VCS has developed Jurisdictional and Nested REDD+ (JNR). The JNR presented a plan for implementing REDD+ strategies across municipal levels, which is from international to national and regional provinces.

Climate Community & Biodiversity Standards (CCBS)

CCBS is a Project Design Standard, which outlines the requirements for accounting and monitoring of projects and carbon credits but does not issue certified offsets (Kollmuss et al. 2008, 48). CCBS concentrates on assurance of positive social and environmental impacts for land use projects. The issuance of credits relies on a recognised affiliating program, for instance VCS. All land use and forestry projects are enlisted, including ARR, REDD, IFM and agriculture practices. (Climate, Community & Biodiversity Standards 2017, 6.)

From 2014, CCBS has been under the management of Verra. CCBS is commonly used in conjunction with VCS for supplementary co-benefit enhancement; and hence a better leveraged selling price (by 9%). In 2016, 23% of offsets sold under VCS were certified by CCBS (Hamrick & Gallant 2017, 15).

Gold Standard

Founded in 2003 by a group of international non-government organisations led by WWF, Gold Standard ensures sustainable impacts of emission reduction projects adhered to the CDM. It was re-introduced in 2017 under the name “Gold Standard for the Global Goals” in alignment with the publishing of the Sustainable Development Goals (SDGs). (Gold Standard 2018.) Gold Standard is also a Full-fledged Standard (Kollmuss et al. 2008, 48); and “the most rigorous certification standard globally for carbon offset projects” (WWF 2019).

AR is the sole qualified forest activity under Gold Standard. Programs shall follow the forest definition of its UNFCCC national forest definition, or FAO requirements in case of no defined terms.

Plan Vivo

Plan Vivo concentrates solely on smallholder and community-led land use and forestry projects. The standard adopts numerous mechanisms to support smallholders in developing their own offset programs. Developers are given full flexibility to adapt their projects to the needs and characteristics of the selected area and its inhabiting community. The scope of forestry program covers AR, REDD, rehabilitation and restoration activities – re-establishment of an ecosystem or its indigenous characteristics to an extent as close to the origin status as possible, and agroforestry (Plan Vivo 2016, 4).

In contrast to the traditional distribution of credits after delivery of emission reductions (ex-post), Plan Vivo offers issuance of ex-ante credits – credits given before future activities are performed. This acts as a start-up funds for smallholders to pre-finance their activities. Ex-ante credits are issued providing: the project is approved as Plan Vivo and have met its first performance targets; and a Payment for ecosystem services (PES) agreement is in place between project developer and participants (Plan Vivo 2017, 23).

Each standard has its own strengths. VCS offers exposure to private organisations; beneficial for large-scale projects looking for bulk buyers. CCBS supplements additional co-benefit enhancement to VCS, and hence a more leveraged selling price. Gold Standard equals credibility – being the most rigorous towards both emission reductions and positive community and biodiversity impact. Plan Vivo employs a technically more lenient and smallholder-friendly approach, which is suitable for starting projects of a smaller-scale.

2.5 The supply chain of a forest carbon project



Figure 3. The supply chain of a forest carbon project (Source: Hamrick & Gallant 2017, 2).

The processes and steps involved vary across standards (Appendix 1), but the principal components are identical. Project ideas are conceptualised into a Project Idea Note (PIN), where developers assess the practicality of the activities proposed and all risks involved. A detailed plan of how results are monitored and reported is then composed into a Project Design Document (PDD).

The PDD is validated by an authorised third-party expert or an established in-house panel, who assesses whether the proposal fits into the framework of its pursuing standard. Once validated, the project enters the standard's registry and the implementation period commences. During implementation phase, monitored performance is to be reported annually. Emission reductions achieved are verified by an independent expert before credits are issued.

2.5.1 Components within technical design:

The scope of activities for technical development encompasses firstly demonstration of additionality. Additionality answers the question: “Would the project happen anyway without inclusion of carbon credits?” A project is additional if the answer is no. Such barriers prohibiting project implementation can be of legislative, financial, demographic or technical reasons. For instance, it is not executed to fulfil compulsory reduction obligations; if the development cost is unaffordable without carbon revenues; or if implementation barriers withholding non-carbon projects to commence are now overcome. (Kollmuss et al. 2008, 15-18.)

Secondly, the baseline is determined. Baseline is the so-called “business-as-usual” scenario without intervention of project activities. To put in question: “What would have happened if no trees were planted (AR), if forest exploitation continued (REDD), or if forests were maintained at the current quality and quantity (IFM)?” The net results from a project, such as total sequestered emissions or livelihood benefits, are measured as the difference between final project outcomes and the baseline. (Kollmuss et al. 2008, 18.)

Projects carry inherent risks, specifically to compromising total greenhouse gas emissions. Such risks must be nominated in technical design.

- Leakage: The local communities’ livelihood depends greatly on the nearby forest areas and its wood and non-wood products. Therefore, forest preservation in one area may shift their activities to another; hence emission reduction in the project area can result in increasing emissions in its nearby regions. (Kollmuss et al. 2008, 20.)
- Non-permanence: Forests can only sequester carbon for a definite amount of time. The release of carbon into the atmosphere varies based on impacts on such forests, from insignificant with sustainable wood processing practices, to moderate if the trees contract pests or are extracted illegally,

to remarkable should there be forest fires or on-purpose burning. (Kollmuss et al. 2008, 21.)

- Buffer pool: Standards adopt a common practice of establishing a carbon buffer pool. Projects are required to allocate a percentage of their credits to this pool, which stands as a “deposit” against possible disruption. The deposited offsets cannot be sold. The share of credits is determined based on the risks a project carries. Should the project successfully alleviate these risks, a portion of its buffer account is returned and hence can be used for commercial purpose.

Additional technical inputs are geographic information of the project area. Such data is to be submitted upon the feasibility assessment of a PIN, or as a component within the PDD. The details of the data varies, under Gold Standard, such data must be presented in vector format (Gold Standard 2018).

2.5.2 Components within project certification:

The subjects under assessment can be divided into two groups: carbon and non-carbon performances. An important note in project certification is that the validating and verifying bodies can only inspect if the project is designed as required, and implemented as designed. They cannot qualify the rigor of these requirements. The credibility of a project, therefore, is exhibited in not only its certification status but also the standard that it follows. (Kollmuss et al. 2008, 34.)

Carbon credits:

Carbon sequestration should be realistically estimated, measured and documented. All sources of major leakage must be addressed and compensated accordingly. In verifying carbon sequestration, the VVB shall review the annual monitoring plan and risk management. The items to be identified and accounted

for by a technical developer in 2.5.1 shall be qualified by a VVB upon project certification.

Co-benefits:

A project, in addition to mitigating climate change, should also contribute to all inhabitants within its operating areas. Co-benefits, therefore, consist of environmental and social impacts (Kollmuss et al. 2008, 28).

Environmental safeguards prevent leakage beyond greenhouse gas emissions. The project must not upset the pattern of natural resources such as water, soil and animal lives; and not increase area susceptibility to natural disasters.

Projects have direct impact on the indigenous residents. Community engagement, therefore, is mandatory. CCBS demands stakeholders be given access to project information and participation in decision-making. Gold Standard maintains that indigenous habitats must be respected; especially scenes of cultural and religious importance. Plan Vivo calls for community-led planning, which aims at identifying the locals' needs and defining corresponding activities in priority to these needs.

The ultimate social outcome is for the beneficiaries to see socioeconomic improvement during and after the project. Community benefits, similar to carbon sequestration, are also measured against a baseline. Standards prioritise their contributions. Gender equality is of paramount importance for Gold Standard. Projects, as a result, must seek to close the gender gap in every facet of their operations. This value is also embedded in CCBS. Plan Vivo, on the other hand, strives for improving livelihood of smallholders. The rigor of its requirements, therefore, lies in terms of PES agreements, from equitable benefit sharing to transparent and timely payment process.

CCBS, Gold Standard and Plan Vivo necessitate fundamental working conditions. This includes ensuring of minimum work safety, provision of adequate

training and prohibition of discrimination especially against women. (Climate, Community & Biodiversity Standards 2017, 16-19; Gold Standard 2018; Plan Vivo 2013, 20-23.)

Table 2. Overview of the nominated voluntary carbon standards.

Market Share & Price per offset (2016)	Forestry Project Types	Social	Environmental	Buffer Pool
VCS				
33 MtCO _{2e} (58%) €2.3	<ul style="list-style-type: none"> • ARR • IFM • REDD 	through CCBS	through CCBS	Varied
CCBS				
7.7 MtCO _{2e} (13%) € 3.90	<ul style="list-style-type: none"> • ARR • IFM • REDD 	<ul style="list-style-type: none"> • Community engagement in the project lifetime. • Areas of significant importance for the locals shall be identified and respected. • Community adaptation to climate change. 	<ul style="list-style-type: none"> • No disturbance to soil, water or animal welfare. • Sustainable forest management demonstrated. 	Varied
Gold Standard				
10 MtCO _{2e} (17%) € 4.60	<ul style="list-style-type: none"> • AR 	<ul style="list-style-type: none"> • Areas of significant importance for the locals shall be identified and respected. • No involuntary relocation of people. • In the events of disputes between the workers and locals, stop all operations until the issue is fixed. • General work satisfaction from all workers. • Provision of occupational health & safety to workers. • No forced nor child labour. • No discrimination and harassment. • No corruption. • Gender equality and women empowerment. 	<ul style="list-style-type: none"> • Well-adapted tree species. • No use of Genetically Modified Organisms. • Enhancement of flora and fauna habitat connectivity. • Minimum 10% of project area for conservation of native ecosystem diversity. • Prevention of soil erosion. • Avoidance or justified minimal usage of fertilisers, chemical pesticides and biological control agents. • Buffer zones of 15 meters on each side of water sources: only native tree species, no 	20%

			<p>timber harvesting activities, no use of fertilizer or chemical pesticides.</p> <ul style="list-style-type: none"> Waste shall be identified and well-handled. 	
Plan Vivo				
<p>0.4 MtCO₂e (0,65%) € 8.00</p>	<ul style="list-style-type: none"> AR Avoid deforestation Restoration/ Rehabilitation Agroforestry 	<ul style="list-style-type: none"> Community-led planning to design project components most suitable for the locals' needs. Trainings for farmers. Socio-economic impact assessment. Sale agreements in place between developers and farmers. Transparent payment process. Payments are delivered in full and recorded. Livelihood enhancement with upscaling potentials. 	<ul style="list-style-type: none"> Only native and naturalised species. Wider impacts on local and regional ecology identified and expressed. 	<p>10-30% (Normally 20%)</p>

2.5.3 Comparison of standard-related project development fees

Table 3. Comparison of standard-related project development fees.

	VCS ¹		CCBS ²		Gold Standard ³		Plan Vivo ⁴	
Review Fees					Project Idea Note review	€ 3150	Project Idea Note review	€ 675
					Project Design Document Review (per credit)		Project Design Document review	€ 1620
					VER Carbon	€ 0,135		
					CER Carbon	€ 0,045		
						minus Preliminary Review Fee		
					Performance Review	€ 2250		

¹ VCS. 2017. Program Fee Schedule. https://verra.org/wp-content/uploads/2018/03/Program_Fee_Schedule_v3.7.pdf

² Climate, Community & Biodiversity Standards. 2017. CCB Program Fee Schedule. <https://verra.org/wp-content/uploads/2017/11/CCB-Standards-Fee-Schedule-v3.2.pdf>

³ Gold Standard. Gold Standard for the Global Goals Fee Schedule. <https://globalgoals.goldstandard.org/fees/>

⁴ Plan Vivo. Registration costs and fees. <http://www.planvivo.org/develop-a-project/costs/>

Validation Fees		€ 2250		€ 2250	Standalone	€ 4500		€ 900
					Programme	€ 18000		
					First Validation Fee	€ 2250		
					Additional Validation Fee	€ 2250/ voluntary project activity		
Registration Fees	Verification period \geq 1 year	€ 0.09 x (Estimated annual volume of emission reductions)			Annual Registry Account Fee	€ 900/year		€ 900 - € 3600
	Verification period < 1 year	€ 0.09 x (Verification period quantity)						
		€ 9000 cap						
Verification Fees	included in validation fees			€ 4500	Standalone	€ 2250/year		
					Programme	€ 1350/ voluntary project activities/ year		
		€ 0,09		€ 0,045	VER Carbon	€ 0,135		€ 0,36

Issuance Fees (per credit)		minus Registration Fees		minus Verification Fee	CER Carbon	€ 0,045		
						minus Performance Review Fee		
Other Fees	Retroactive label fee	€ 1350/event			Additional review	€ 45/hour	Additional Technical Review	€ 720
	Methodology approval fees				Methodology approval fees	contact	PDD Updates	€ 0 - € 450
	New methodologies revisions	€ 9000			Renewal of crediting period (per credit)	€ 0,135		
	Modules and tools revisions	€ 4500			PDD Updates (per credit)	€ 0.09 (€ 450 minimum)		
	Expert application fee	€ 338				plus issuance fee		

3 FINDING AIM AND OBJECTIVES

The overarching aim of this study is to find an entry pathway to the forest offsetting market. After a literature comprehension of the sector, the thesis will position Arbonaut in the supply chain of forest offsetting, and analyse the feasibility of each proposal. From the arguments formed, the thesis will conclude with a pathway for market entry. These objectives are clarified through the following questions:

- What are the potential roles for Arbonaut in the supply chain, and what are the strengths and weaknesses of Arbonaut for each role?
- Who are the potential competitors for each of the nominated roles?
- What are the most current needs of carbon traders for each role?

4 MATERIALS AND METHODS

The analysis is comprised of three parts: SWOT analysis, competitor comparisons and thematic interviews. The former two are conducted from secondary data, and the latter is the primary data collection of this study.

SWOT analysis is a marketing analysis tool used to define a company's current position in the market. SWOT comprises of: strengths, weaknesses, opportunities and threats. The former two assess the internal environment of the company, whereas the latter two see the external counterpart. The strengths and weaknesses of a company are its characteristics that contribute directly to its ability or inability, respectively, to meet its business objectives. They can be for

instance resources, know-how, or capacity. The opportunities and threats are the external conditions that benefit or hinder its success, such as market trends.

SWOT analysis assists an organisation in reacting to its environment, by benefiting from the favourable opportunities through utilising its prominent strengths, and avoiding encountering the threats with its limitations. (Kotler, Armstrong, Harris and Piercy 2017, 51-52.)

The secondary data used for SWOT analysis are carbon standard documents, such as requirements on land use and forestry project activities, co-benefits and technical requirements. Input from Arbonaut were thereafter provided to assess the accuracy of the study's positioning of the company.

The company also assisted in the nomination of existing and potential competitors for the competitor comparisons. Various sources were utilised to form as comprehensive an overview as possible (through secondary data) on the competitors' portfolios and operations. These include company websites, project documents, and articles of related contents.

The purpose of this study is to identify areas of contribution for Arbonaut, that is, where the company can bring added value to the supply chain. The interview supports this purpose through provision of inputs from South Pole– an international carbon project developer and carbon credit trader.

The interview was semi-structured with three main parts: (1) Self introduction of the interviewee, (2) Their experience-driven opinions on forest carbon projects, and (3) Current needs and areas of collaboration. (Appendix 2)

5 RESULTS

5.1 SWOT analysis

Based on researches on the supply chain of the market and Arbonaut's portfolio, the following positions are suggested:

5.1.1 Technical partner

A technical partner reviews eligible methodology published by the pursuing standard, and designs the monitoring plan accordingly. Once the project is approved, it is the technical partner who will set up the geographic information system (GIS), and measure the carbon to be sequestered during the project lifetime. Monitoring reports are to be composed and submitted annually to the standard, and an overall report submitted for verification. Technical assistance is demanded by developers throughout a project lifetime, and supplied by GIS solution and forest technology providers. (Figure 4)

Table 4. SWOT analysis of Arbonaut's role as a technical partner.

Strengths	Weaknesses
<ul style="list-style-type: none"> In-house experts on forest inventory and climate change Well-established portfolio of tailored GIS services internationally Innovative and efficient solutions References as a technical partner in REDD+ projects in developing countries 	<ul style="list-style-type: none"> Limited number of in-house experts on carbon accounting No existing experience in calculating leakage and non-permanence Human resources to update on new methodology published and required
Opportunities	Threats
<ul style="list-style-type: none"> Sub-contractor (as a technical partner) with project developers, for instance regional NGOs Plan Vivo strategy fits with Arbonaut's strengths System maintenance post-project 	<ul style="list-style-type: none"> Highly competitive due to low entrance barriers Pre-finance issues with project developers before carbon credit earnings

Sub-contracted as a technical partner is an approach already commonly employed by Arbonaut during REDD+ project development. An extensive background in technical assistance for REDD+ projects has supplied Arbonaut an in-depth resume in carbon accounting. The company has determined the forest reference levels (equivalent to baseline) through multisource; using Lidar-Assisted Multisource Programme (LAMP) in Nepal, and Satellite Land Monitoring System + National Forest Inventory (SLMS+NFI) in Pakistan. Estimation of total carbon sequestration, as a mandatory project component, hence pertains to the company's portfolio.

Furthermore, Arbonaut designed and deployed measuring, reporting and verification (MRV) systems for REDD+ countries, which monitor and report on greenhouse gas emissions. Their works encompass MRV methodology design (Senegal), system development (Pakistan), and application improvement (Vietnam). The core of measuring functions for an MRV system is based on GIS, for which Arbonaut is a tailored international provider.

Through provision of measuring systems and services, there are also opportunities for post-project system maintenance and up-scaling for Arbonaut. Human resource is the only investment needed – for a technical staff to actively update with the latest methodologies approved, required and published; and inform the team accordingly.

There are still capacity gaps. Arbonaut has yet to calculate and address leakage and non-permanence – the two most substantial risks of forest carbon projects. Leakage is normally handled by assessing the potential logging impact area outside the project area (projects leakage between national borders is assumed not to be relevant). Permanence assessment requires monitoring the project area for a longer period of time to see if any reversals are taking place within the project area.

Determination of risk factors, assessment of the nominees and mitigating actions require a profound comprehension of the local circumstances and close

collaboration with legislative makers. Arbonaut has a long history of collaboration, both as a lead and sub-contracted partner, in project development with local organisations in the host countries. This offers a solution to compensate for the missing local knowledge. The company itself is also familiarised with selected regions, having participated in National REDD+ strategy development for Nepal, Ethiopia and Uganda. Technicality-wise, Arbonaut has the necessary tools and experts for risk assessment once the nominated inputs are provided.

The sector, due to low competition barrier, is highly competitive between forest inventory providers. Cooperation as a technical partner with regional developers will out-scale Arbonaut's reach to cross-provincial and -national scopes.

From a strategic viewpoint, Arbonaut employs an innovative approach in service design. This fits most perfectly with Plan Vivo, which offers full flexibility to develop methodologies that are most suitable with the host region circumstances.

The most substantial concern is pre-financing. During preparation of concept note, even before approval is granted, all partners involved have to put their staffs forward, and should spare a reserve for business development -related tasks. Moreover, carbon revenues are only paid after delivery of emission reductions. Any issue occurred can potentially lower the total amount of carbon credits compared to initial estimation to reimburse such incidents, or prolong the project length; hence stretches or deflects the total budgeting. The carbon revenues loss can bring substantial accompanying financial loss for development partners, especially with Plan Vivo allowing a maximum of 40 percent of earnings for all project development costs.

5.1.2 Validation and/or Verification Bodies (VVBs)

A validator confirms that the project, especially its technical design, fulfils the standard requirements. A verifier quantifies the carbon credits accounted is legitimate, noting the project's impacts on the community, neighbouring

emissions (leakage), and measuring methods. A VVB is demanded (hired and paid) by the project developers, but qualified by and report to carbon standards. The services are provided by environmental consultancy agencies. (Figure 4)

Table 5. SWOT analysis of Arbonaut's role as a VVB.

Strengths	Weaknesses
<p>Well-established portfolio of forest inventory → Good understanding of carbon accounting and reporting</p> <p>In-house experts on climate change mitigation and adaptation</p> <p>Profound knowledge of the local circumstances in selected countries (i.e. Nepal, Tanzania)</p>	<p>Long learning curve</p> <p>No existing team of experts that meet the requirements</p>
Opportunities	Threats
<p>Direct certifier for small-scale projects</p> <p>Verification for well-established standards (VCS, Gold Standard)</p> <p>No issues of pre-finance</p>	<p>New entrant to the validation/verification business</p> <p>The team needs to be re-qualified periodically by the standards</p> <p>Separation of validation and verification entities</p> <p>Marketing resources on new services provided</p>

There are two entry pathways for Arbonaut. Direct certification for small-scale projects is the first option, for which Arbonaut will collaborate closely with both carbon traders and project developers. Small-scale certification allows Arbonaut more room for innovative solutions, which aligns with the company's strategy.

The alternative is to be accredited as a VVB under well-established standards. Accreditation for dominating players offers higher market exposure. In return, VVBs are obliged to follow rigorous selection requirements and exhibit proof of

engagement pre- and mid- accreditation periods. The granted approval status is not perpetual, under Gold Standard a VVB is qualified for a period of 36 months.

As a VVB, the weight on business development is lightened for Arbonaut – no need for establishing rapport from scratch like in project development. Validation and verification are two crucial steps for a project to receive approval and carbon revenues, which indicates the demands for such service providers, therefore the stress of financing is also lifted.

Arbonaut houses a diverse team of experts in the field of forestry (forest inventory), GIS analytics, software development and climate change mitigation/adaptation – all crucial for the profile of a VVB team. Arbonaut's strengths as a technical partner also benefits the company as a certifier. REDD+ team, in addition to a profound understanding of carbon measurement and reporting, also participates in climate change issues.

However, core auditing skills are missing. The project design document is published for a 30-day public comment prior to validation, and public consultation is required to conclude verification. Both call for interview conducting skills, preferably from an expert who speaks the local language and understands the local behaviour.

The sector poses higher entrance barriers for Arbonaut. In order to announce its new line of services to the market, the company must sponsor the groundwork in-between including thorough researches of the sector, preparation of competencies and resumes as required, and accreditation under pursuing standards. Nevertheless, most of the nominated standards employ the same accreditation program, such as ISO 14065. Therefore, Arbonaut does not need to go through four completely separated procedures in order to achieve accreditations.

Once approved as a VVB, the team should be actively pursuing projects in order to reimburse the development costs arisen prior to and during their accreditation status. This coheres to the need for marketing efforts. The market is dominated by environmental consultancy firms, not technical providers. Currently, Arbonaut

is branded as “a technology provider for natural resources management”, and the services offered are hence not associated with consultancy (even with references in the field).

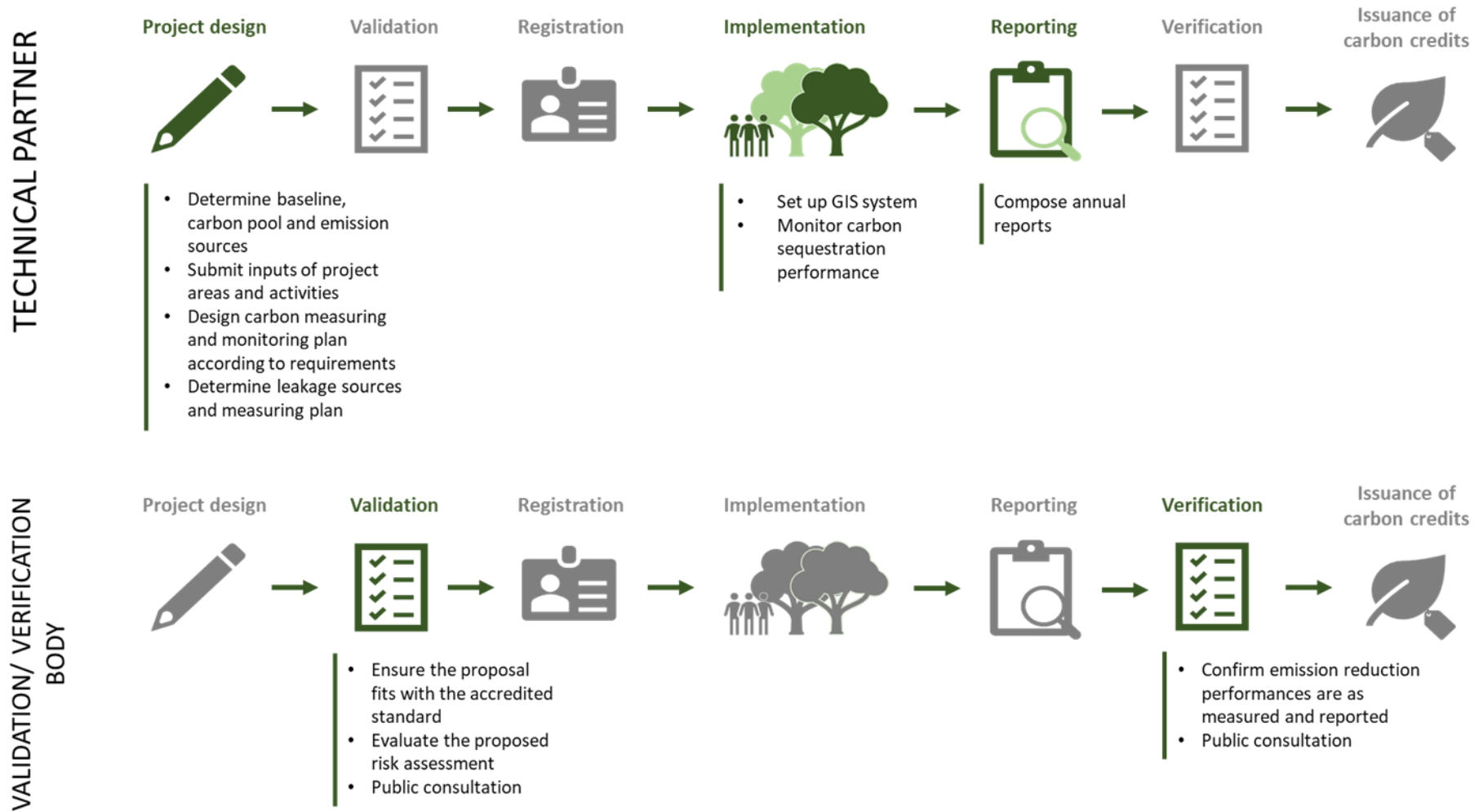


Figure 4. The roles of a technical partner and a VVB in the supply chain of forest emission trading, identified by this study.

5.2 Benchmark analysis of existing competitors

Table 6. Comparison of services offered by Arbonaut and its existing and potential competitors.

	Arbonaut	Technical Provider			Environmental Consultancy	
		IGN	KartECO	Indufor	SalvaTerra	Simosol
Positioning	Technology provider for natural resources monitoring	Reference for geographic information	Advisor for natural resources management	Advisor for sustainable forest industry value chains	Advisor for successful development initiatives	Technology provider for timber production optimisation
Services						
Carbon assessment	Forest inventory (Lidar, Satellite)	Forest inventory (Satellite)	Resource monitoring (Satellite)		Forest pre-inventory and inventory (Satellite)	Forest inventory (Satellite)
	Land use and land cover mapping			Resource mapping		Forest mapping
	Carbon stock assessment					Carbon modelling Carbon analysis
					Modelling of forest dynamics	
Resource monitoring systems	Reference level	Nature and landscape information system		Reference level		Timber supply chain management system

	MRV REDD+	Forest use monitoring		MRV REDD+		
	Natural resource monitoring system			Natural resource monitoring system		
REDD+	REDD+ National Strategy, Safeguards (SESA)			REDD+ National Strategy, Safeguards (SESA) and Frameworks (ESMF)	REDD+ National Strategy	
	Climate change adaptation			Climate change adaptation		
	Policy development			Policy development		
Consultancy		Publication of sustainable forest management indicators	Forest observatory in South East Asia Environmental assessment		Biodiversity and socio-economic studies	Prefeasibility assessment
		Forest availability studies				
Differentiation	Expert team LAMP: Lidar-assisted carbon assessment	National provider of geographic data		Team In-depth and long-term consultation		Iptim: Supply chain optimisation
Regions of competition		Africa (French-speaking)	South East Asia	Globally	Globally	South East Asia

The listed companies in Table 6 are classified into two main groups: direct competitors and potential competitors. Two fields of competition are technical assistance and forest consultancy. Direct competitors are those who Arbonaut has encountered in the past, and both partners see no collaboration opportunities. Potential competitors are those of overlapping expertise, and hence can potentially compete with Arbonaut in certain proposals. Some of them have also cooperated with Arbonaut in the past, and Arbonaut also views them as collaborators.

IGN is Arbonaut's direct competitor in remote-sensing services for French-speaking African countries. There is no barrier for the company should it choose to proceed as a technical partner. However, the company is not perceived as a threat in other domains.

An extensive offer in carbon inventory makes Simosol a potential competitor in remote sensing data collection. For Arbonaut, nevertheless, Simosol is viewed as a partner. Overall, the company has a stronger focus on timber industry management. Simosol strengths are in innovative solutions, which is exhibited in its forest information management and planning system and growth modelling simulation. Simosol is a consultant for economic, technical and practical viability accompanying analysis.

KartECO is a competitor on remote-sensing in Southern Europe and South East Asia. KartECO operates on all fields of natural resources management, which besides forest includes water, soil and air. Generally, the company is not a direct competitor, as its operating countries are different from Arbonaut. Yet its profile in natural resources consultation makes KartECO a suitable applicant for the role of both technical advisor and VVB, especially in assessing and measuring environmental impacts.

While most of the competition is on satellite image processing, Arbonaut is an expert in lidar-based data collection. For climate change projects, the company developed Lidar-Assisted Multisource Programme (LAMP) approach. LAMP collected field data through lidar in selected areas, and expanded the data model

through remote-sensing. This comes as an advantage, as data collected using LAMP approach is more accurate, complex and economical in large area compared to the traditional methods.

Indufor is Arbonaut foremost competitor in REDD+. The company is of similar profile with Arbonaut in technical provision, but exceeds it in policy assessment and development. Indufor is not carbon-focused, yet it has the existing capacity and know-how for assessing carbon sequestration and baseline. Indufor is not into remote-sensing, and is not a competitor in technical provision. Its social knowledge is suitable for a general project developer role. The company is a potential competitor in certification services. Moreover, Indufor is present in the continents of Europe, America, Asia and Australia; making it Arbonaut's most dominant global competitor in both forestry and technical consultancy. Its strong present in Asia Pacific will undeniably serve as a barrier for Arbonaut's operation.

SalvaTerra has participated in forest carbon projects. The company is mostly involved in the design phase, including developing carbon monitoring plan, and during fund-raising. However, SalvaTerra and its experts are young, and the services offered are stretched onto all relevant fields instead of selective specialisation. This can be viewed as a drawback in project proposals, whose benefactors demand an implementation team of comprehensive knowledge. SalvaTerra, nevertheless, is a potential VVB as perceived from the width of their service portfolio, but not from the depth of their experience.

An expert team of diverse backgrounds and regions is the winning point for Arbonaut in REDD+ and consultancy services. Its operating footprint is strongly present in Africa and Nepal. With its experts, Arbonaut has exceeded several listed competitors in previous proposals.

5.3 Thematic interview

South Pole is an international carbon project developer. The company administers the whole carbon cycle: besides development and implementation, their works encompass validation and verification support, and registration under carbon standards.

South Pole projects are demand-driven. Forest offsetting has received increasing attention from the private sector in the last two years, and even more so now, subsequent to the latest IPCC report. Land use and forestry were mentioned as natural carbon sink providers; which is urgently needed to halt the 1.5°C global warming above pre-industrial level milestones. Since the publishing of the report, South Pole witnessed an increase in the number of both forest carbon credit buyers and quantities, with the main client group being carbon-neutral corporations.

Forest carbon credits, as risky as the experts' concerns, bring tangibility; meaning there are visual results accompanying the credits produced. This is a preferred feature by corporate buyers to communicate their climate change efforts to their consumers – especially with AR projects. Another indication of this is that the external stakeholders – traders and buyers – are less risk-conscious compared to their internal counterparts. The credibility of a credit is adherent to the standard it is labelled under, for which Gold Standard holds the premium reputation.

South Pole follows VCS (and CCBS) for their Land use and forestry projects. VCS is impeccably established for this sector; its methodologies are fully developed for all project types. Should there be demand for further co-benefits application, CCBS label is then applied. A comprehensive guideline is also why the standard is preferred by South Pole.

Gold Standard is demanded for good publicity (the standard founded and advocated for by WWF). However, it has not been recently and dominantly active

in Land use and forestry. The standard is of much stronger presents, which is accompanied by comprehensive technical methodologies in other sectors, such as renewable energy. Furthermore, Gold Standard does not cover all forestry project types. The standard excludes avoid deforestation activities. Nevertheless, Gold Standard is used for small-scale AR projects purely for demand-driven reasons.

Plan Vivo was excluded from ICROA Code of Best Practice (2015, 8) due to its leniency, and therefore is not actively promoted by South Pole.

Financially, the wholesale prices of REDD and AR credits are equivalent to the market average – at three to six euros per credit for areas of around 300 000 hectares and at eight to ten euros per credit for areas of 10 000 hectares respectively.

There is uncertainty with the costs to be charged by the VVB. No quotation for certification services were published online by the certifying organisations, the numbers can only be accessed from project annual reports and therefore are not a representative of the costs. This issue was discussed during the interview. South Pole budgets approximately 20 percent of total costs to cover VVB expenses.

The most current need for South Pole is to identify the right amount of AR projects. Even though positioned with a higher price than REDD, AR bears its own challenges. The attractiveness this activity posed for buyers is not mutual for the land owners, who are more convinced of other economic purposes with faster gains.

Another ongoing need within project development is in data quality – not only to be presented to the standards but also the conscious buyers. A profile of reliability, experience and reputation for quality in the field is therefore an assets South Pole values in their partners.

6 INTERPRETATION

Arbonaut's strengths and preferences lay within innovativeness; for which Plan Vivo offers the best conditions. Furthermore, Plan Vivo projects are on a smaller scale, which is more suitable economically and practically for a new market entrant to start with.

Plan Vivo, although matches with Arbonaut's preferences, is not favoured among the big industry players. This is due to two notable reasons. Firstly, corporations are bulk buyers, and Plan Vivo projects do not have the capacity to produce such large quantity of credits. Secondly, and of utmost importance, Plan Vivo does not provide the paramount credibility corporations demand to communicate their efforts.

Nevertheless, this does not mean a dismissal of the standard, rather a better understanding of its application. With Plan Vivo, a developer navigates what is most suitable for both them and the smallholders. This excels for piloting projects. In VCS and Gold Standard, a project is moulded within the principle of methodology requirements. Both standards employ projects on a larger base, and distribute to a larger demand.

Arbonaut's competitive offer is its data collection methods Lidar-Assisted Multisource Programme (LAMP). Satellite data is free, however is not accurate and frequently demands complementary field-plot data which in turn creates added expenses and time. Lidar-based data, on the other hand, offers accuracy on multilayer level, however is not the most economical solution. LAMP approach mediates between these two options, provides more accurate and detailed information at a timely manner, and at more economical price points.

Not only does Arbonaut have an internal team but also an external network of experts of in-depth expertise in their fields. These fields include from technical advisor in remote-sensing, GIS and software development; to climate change

consultant in forestry, social and environmental assessment, and capacity building.

As a revision of the prior SWOT analyses, Arbonaut does own the essential strengths to exploit the market opportunities. The company is an experienced provider of quality data with innovative data collection methods, in a market where developers demand long-term expertise and quality information from its suppliers. However, these strengths are unknown to the market players, and most importantly the potential clients. They only become evident upon project bidding, which is when Arbonaut applies to be a service provider in response to a call for proposals, and submits its experts' resumes.

A crucial notice is that while forest offsetting does yield income, the vitality of the whole project should not be dependent solely on credit earnings. Rather, the revenue is supplementary for Payment for ecosystem services (PES) or development funding. This specific point was not drawn from the analyses directly, however the author encountered several cases of misunderstandings toward carbon credit revenues while conducting the study.

The findings of this study should be assessed with limitations. The benchmark analysis is subjected to a limited access to data. The nominees are not existing providers of technical services for forest carbon project development. There is no external database published with such information. However, the companies listed in this study do provide the services that a technical developer or VVB does, and are Arbonaut's existing competitors.

7 CONCLUSION

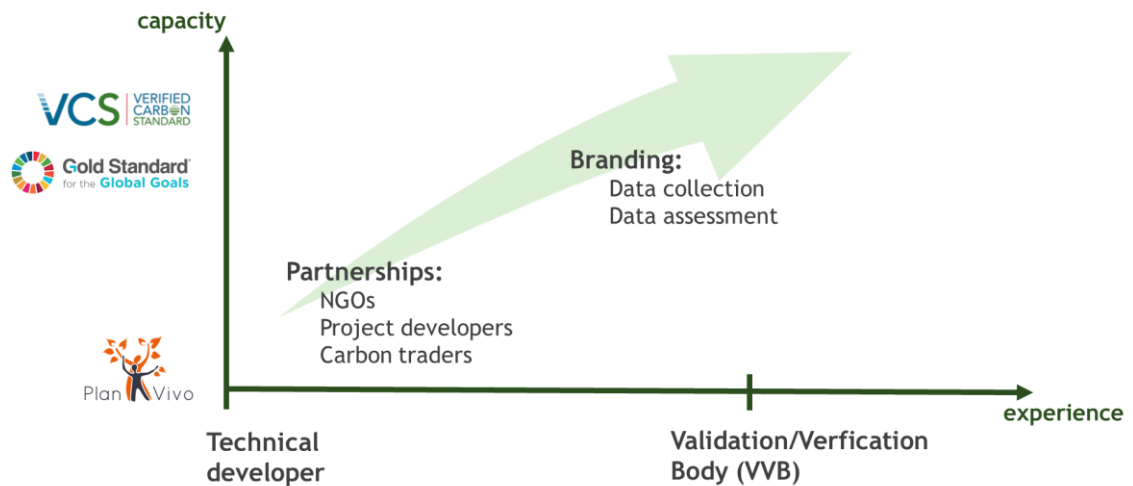


Figure 5. The thesis' suggestions for Arbonaut.

Promising and yet also confusing, forest emission trading does provide opportunities for Arbonaut – both as a technical provider and a consultant.

From this study, the pathway recommended for Arbonaut is to enter the market as a technical developer, most preferably sub-contracted under a partner of existing and thorough regional experience. This collaboration is a beneficial stepping stone for Arbonaut pre-certification.

For piloting purposes, Plan Vivo is the ideal standard. Nevertheless, the belief in Gold Standard has been demonstrated by several traders in the Finnish market alone already, and hence should not be ignored. As Arbonaut grows in experience along the way, VCS and Gold Standard are the next in line for a larger and more stable operations.

Despite having suitable expertise, entering forest emission trading will still be a new line of business for Arbonaut. Therefore, it is crucial for Arbonaut to strengthen and realise new partnerships with the following industry player groups: (1) NGOs, (2) developers of bigger capacity and (3) carbon traders.

The first group – NGOs – is vital for close-up collaboration with provincial and national decision-makers and community engagement activities. International carbon developers understand the quality demand from the standard's sides, and holds the necessary capacity to convey these requirements in implementing large-scale projects. Carbon traders are the first informer of market trends that is the clients' demands, which dictate the number of projects, the activities within each project and the standard that the projects follow. All three partners, furthermore, contribute directly to shortening the learning curve for a new entrant to voluntary forest emission trading.

The preparation process for Arbonaut to become a VVB not only requires field work but also branding. Even with its existing experiences and partners in consultancy, Arbonaut is still externally perceived by carbon traders and internally labelled by the company as a remote-sensing supplier and analyst. As an organisation of interrelated departments, it is crucial to communicate a specific service to the direct audience. A technical assistant provides data collection services to project developers and VVB, whereas an environmental consultant performs data assessment on behalf of the standards and project developers.

In conclusion, the study has answered to the questions laid out. Instead of a linear course of actions, entering voluntary forest emission trading for Arbonaut entails not only capacity-building, but also close collaboration with various players, partners and customers, to be the first responders to a market and concept of rapidly changing recognition and demands.

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Project development cycles of the nominated voluntary carbon standards

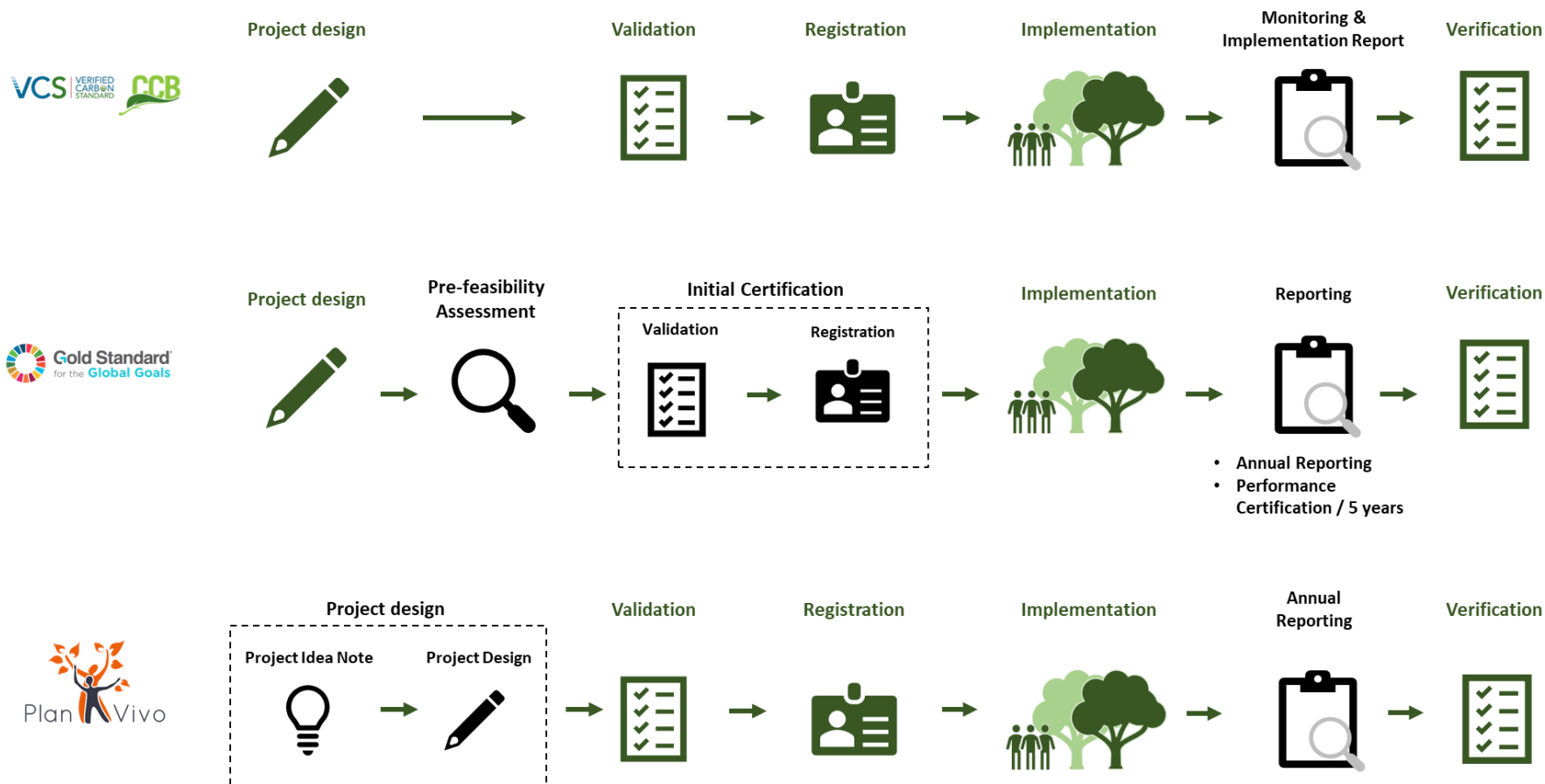


Figure 6. Project development cycles of voluntary carbon standards.

Interview questions for South Pole

INTERVIEW QUESTIONS

THESIS TOPIC:

**MARKET RESEARCH ON POSITIONING ARBONAUT IN THE SUPPLY
CHAIN OF VOLUNTARY FOREST EMISSION TRADING**

I. South Pole

How much is South Pole involving in the project (from the scratch or entering later)?

II. Forest carbon projects

How is South Pole progressing with forest emission trading?

What is the attractiveness of the market (forest carbon) for South Pole?

What standards do South Pole use for forestry projects?

What is the average price of forest offsets developed by South Pole?

III. Area of collaboration

What are the problems South Pole have encountered with forestry projects?

What are your most urgent needs?

What does South Pole value in a good partner?