MSc Finance - Capstone Project
Technical Discussion

Emerging opportunities for financing the transition to a low carbon economy in private sector

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Table of contents

Introduction

Striving to keep below 2°C temperature increase by 2050 compared to the 1990 levels we are living through one of the most important periods of earth's history. Decarbonisation[1] has become one of the main priorities for governments and corporations all around the world, who are joining the efforts to contribute their share to the transition towards a low or carbon neutral economy.

For corporations the transition to low carbon operations is a difficult and complex task that is bound to many challenges including economic viability and technological feasibility.

According to the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC)[2] Keeping below 2°C requires peaking global GHG emissions before 2020 and that the emissions in 2050 are at least 49% to 72% below the level of emissions in 2010. According to the 2014 report of the Global Commission on the Economy and Climate, over 93 trillion USD[3] in financing will be needed for the transition to low carbon economy over the next 15 years.

With strengthening environmental policies, pressure from investors, environmental conscious consumers and employees the corporations start to feel the need to go beyond environmental compliance to keep its stakeholders satisfied. In the last 3 years we saw a strong will and a clear trend across the heavy industries towards carbon reductions but it is only recently, with the finalization of the Phase4 of the EU ETS reforms, when the transition became economically viable for the investors. Looking long term, the carbon taxes and cap-and-trade compliance costs are shrinking the industrial profitability and the companies are looking to decarbonise their productions.

Latest developments in clean energy and low carbon technologies make the solutions accessible for the wide market but a fast and attainable financing is going to play major role in achieving the goals set by Paris Agreement in 2015.

[1] Decarbonisation: ambitious reductions of CO2 emissions

[2] As published in 2013: http://www.climatechange2013.org/images/report/WG1AR5_ALL_FINAL.pdf

[3] The Global Commission on the Economy and Climate is a major international initiative to examine how countries can achieve economic growth while dealing with the risks posed by climate change: http://newclimateeconomy.net/publications

About the project sponsor

Vertis Environmental Finance Ltd. is one of the leading environmental commodities trading houses in Europe, specializing in trading emission allowances under the scope of EU ETS[4], voluntary carbon offsets and energy certificates. As launched in 1998 the company started as one of the pioneers in consulting emission reduction projects under the Kyoto Protocol's[5] Joint Implementation mechanism.

By now the company serves to over 1300 industrial clients around Europe and worldwide, assisted to the mitigation of over 20 million tonnes of CO2, traded over 1 billion allowances and credits and is considered as one of the top notch experts on carbon market.

Vertis trades environmental commodities via exchanges (The ICE, EEX) and on the OTC market. The company provides access to spot as well as derivative products (forwards, futures, swaps and options).

Vertis' mission is to inspire and empower businesses to make the transition to low carbon economy. Until 2017 the company's key tool was to help its clients with sensible trading strategy to minimize costs, manage risk and ensure compliance with the EU ETS.

To level up the carbon mitigation impact across the heavy industry and to answer to increasing interest of the clients, in 2017 Vertis launched a new division, oriented on renewable energy, voluntary carbon offsetting, sustainability reporting, carbon disclosure and climate finance.

[4] EU Emissions Trading Scheme was adopted by Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading and amended by Directive (EU) 2018/410 of the European Parliament and of the Council of 14 March 2018; https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32018L0410

[5] The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997; https://unfccc.int/resource/docs/convkp/kpeng.pdf

About the project

The aim of this project is to provide a simplified overview about the emerging opportunities on the green finance market for private sector.

The project tackles 4 key questions:

- How does the global green finance market work?
- What are the main sources of green financing available and what are their main features?
- How to access the green financing?
- How to choose the most suitable financing from the available options?

Methodology:
The research is done based on the available literature on the web, library and key strategic partners of Vertis.

Beneficiaries:
The research is targeted on available green financing primarily (but not exclusively) for European heavy industry.

Constraints:
The types and costs of financing are strongly dependent on the type of project, company's financial health, existing leverage and equity structure as well as size and business cycle of receiving corporation and therefore it is difficult to assess the ideal suitability of financing type in general.

- The exact access and conditions for reaching particular types of financing are often not published and only available on request by a client.

Exclusions:

- Regular (non-green) financing options including bonds, equity, traditional loans, etc.

Interfaces (how the project fits into overall organization management and relationships with partners):

- The results of the project will directly benefit the new Vertis division (launched in 2017), focused on sustainability, clean energy and carbon neutrality.

Global Green Finance Market

It is estimated that at least $93 Trillion in investment in infrastructure, industrial innovation, R&D, technological modernization, energy efficiency measures and other areas will be required for the humanity's switch to low carbon economy to keep below 2 degrees Celsius temperature increase. This is over 3 times the market capitalization of the listed domestic companies in the United States[6].

Corporate drivers for decarbonisation

Preparation for regulatory change

The Paris Agreement[7] has set an ambitious goal to keep the temperature increase below 2 degrees Celsius compared to the 2010 levels by 2050 to avoid major climate disasters. 195 member states of UNFCCC signed and as of July 2018 179 ratified the Agreement. Should all Parties ratify, it will mean that 98% of the global emissions will be under the scope of the Agreement and subject of compliance. The Agreement is a prove that almost the whole world recognizes the alarming environmental problem we face.

Article 9 of the Paris Agreement is dedicated to climate finance. The Parties agree to do their best to scale up the climate finance by: *"..taking the lead in mobilizing climate finance from a wide variety of sources, instruments and channels, noting the significant role of public funds, through a variety of actions, including supporting country-driven strategies.."*

The EU for example targets to mitigate emissions by 80% by 2050 compared to the 2010 levels. If no new policy is implemented, the reduction achieved would be only about 40%. This means that the private sector should anticipate and prepare for a large amount of very drastic policies and environmental regulation to be implemented and should they wish to keep in business in the next 30 years, they need to keep ahead of the coming changes by acting beyond the current policy compliance.

[6] Data from 2016: https://www.indexmundi.com/facts/indicators/CM.MKT.LCAP.CD/rankings

[7] The Paris Agreement was adopted in 2015 in France by the Conference of Parties (COP21) of the United Nations Framework Convention on Climate Change (UNFCCC): https://unfccc.int/sites/default/files/english_paris_agreement.pdf

Improving regional perceptions

In the recent years there has been a significant sustainability pressure on corporations. Consumers reportedly prefer to buy their goods from sustainable brands, citizens prefer living in a cleaner areas and the watch-dog NGOs are now active more than ever. Moreover the governments help by supporting greater transparency by implementing the measures for non-financial information disclosure all across developed countries. It is in the interest of all corporations to disclose a prudent sustainability strategy and demonstrate climate leadership.

Realigning to industry shifts

The world is in undeniable green wave with whole industries shifting to low carbon production altogether. Leading sectors are: energy, with countries announcing a fossil fuels phase-outs; transportation, with cities prohibiting diesel cars and consumers hungry for electric vehicles; construction, with highly energy efficient, passive or carbon neutral buildings. Companies then strive to stay on the top of this trend to ensure the competitive leadership by adjusting their operations, services and production that can serve the industry demand.

Driving cost and energy efficiency

Efficient management of costs and resources are on the key positions of each CFO's priority list. Companies who choose the smart road yearly save billions of dollars via improvements in supply-chain management, fixing the costs of energy, optimizing the requirements for scarce resources and minimizing the risk of climate change and climate adaptation caused losses.

Generating new demand

Green energy, cars, fast moving consumer goods, fashion, buildings, technology, events or even governments are trending and the private sector is now competing to serve this rising green demand. For companies who decide to act on climate change it can result not only in cost saving but also in new revenue streams. According to the new study from Nielsen[8] on consumer behavior, 45% of respondents cares if their product comes from sustainable brand and 58% is ready to pay more for sustainable products. These statistics are skyrocketing by over 15% every year (for the third consecutive year).

[8] Global Consumer Sustainability Study published by Nielsen in October 2015: http://www.nielsen.com/eu/en/insights/reports/2015/the-sustainability-imperative.html

Improving talent attraction

With Millennials and Generations Y,X coming to the center of the economical production, sustainability has become one of the key strategies to attract and retain talent. The new generations are increasingly motivated by purpose and well aware of the current environmental challenges. It is not an accident that the most desired global employers are often the most sustainable ones.

Differentiating the corporate brand

Initiatives like We Mean Business[9], Carbon Disclosure Project[10], RE100[11], Sustainable Brands[12] or the American We Are Still In[13] movement total up for tens of thousands of corporate brands who position themselves as sustainability corporate leaders to stay ahead of the competition. In addition, companies who incorporate sustainability into their core business models report to have better than industry results in risk management, growth and return on capital.

Engaging with investors and business partners

Starting with the PRI Montreal Pledge and Portfolio Decarbonisation Initiative in 2014[14] and continuing with S&P incorporating sustainability into their ratings[15] the investors started to pay deeper attention to the climate change connected risk and started to decarbonize their portfolios. As the sources of green and low carbon technology financing are pouring to the capital market, the previously "good to have" sustainability development strategies rapidly turning into "must have".

Use of green finance

[9] https://www.wemeanbusinesscoalition.org/
[10] https://www.cdp.net/en
[11] http://there100.org/
[12] http://www.sustainablebrands.com/
[13] https://www.wearestillin.com/
[14] http://montrealpledge.org/
[15] How Does S&P Global Ratings Incorporate Environmental, Social, and Governance Risks Into its Ratings Analysis, November 21, 2017: https://www.spglobal.com/our-insights/How-Does-SP-Global-Ratings-Incorporate-Environmental-Social-and-Governance-Risks-Into-its-Ratings-Analysis-.html

Once the corporations identify the need to implement environmental strategy, measure their carbon footprint, they need to map the potential mitigation areas and ensure suitable financing.

The main areas of uses of green finance are:

- Green buildings
- Green products and materials
- Renewable energy (solar, wind, hydro)
- Sustainable land management, (sustainable agriculture, forestry)
- Transport (urban rail/metro, electric, hybrid)
- Waste management (recycling, waste management)
- Climate adaptation (conservation, bio system adaptation)
- Carbon capture and storage
- Energy efficiency (cogeneration, smart grid)
- Environmental protection (pollution control, prevention, and treatment)
- Water (water efficiency, wastewater treatment).

The role of the money market is to provide financial resources to enable these investments.

Key green finance market stakeholders

Examples of key stakeholders of the green finance market are:

- *Multinational organizations* like The World Bank (providing green funds to national banks), European Investment Bank (providing green loans for commercial banks or taking part in syndicated loans for large projects in private and public sector or lending to commercial banks), European Investment Fund (equity investments).
- *Commercial banks* (financing via green loans to large, medium or small projects)
- *Exchanges* (dedicated green exchanges or traditional exchanges listing green bonds, equity or green ETFs)
- *Associations* like Global Green Finance Council, World Federation of Exchanges, and International Capital Market Association, which aim to connect stakeholders of the green money market, advocate for policy advancement, promote green finance and accelerate the access and use of green finance.
- *Lenders* from both, public and private sectors

Pros and Cons of using green finance

The advantages of green finance are mostly economical. While issuing green bonds or taking green bonds to finance the environmental projects the companies can claim tax exemptions or income tax discounts in some jurisdictions. UNEP FI report on Green Financial Products and Services[16] mentions several concrete examples of income tax discounts while consuming or producing environmentally friendly products or services. Discounts apply to industrial, real estate, transportation or technology areas. Discounts then influence the company's cost of financing and finally the return on investment. While taking a loan from EIB for example, the longer the loan repayment period the more significant the green discount compared to the commercial loans.

It is important to keep in mind however, that green financing also has its (mostly operational) disadvantages. To access green finance the projects have to undergo extensive and lengthy due diligence procedures to prove the eligibility of the project for green financing. Required reporting and disclosure of the funds allocation can also create additional operational burden. Finally, the green finance market still lacks transparency and formal compliance processes. Green bonds can be defined differently depending on the issuing body, jurisdiction or standard. Companies have to make maximum to avoid potential greenwashing[17] brand accusations and issues with compliance.

[16] UNEP Finance Initiative report on Green Financial Products and Services from 2007: http://www.unepfi.org/fileadmin/documents/greenprods_01.pdf

[17] *Greenwashing* as defined by the Cambridge Dictionary: *To make stakeholders believe (misleading) that the company is doing more to protect the environment than it really is:* https://dictionary.cambridge.org/dictionary/english/greenwash

Available Options For Green Financing In Private Sector

Companies can choose from various types of financing:

Green Equity

Firstly in the form of green equity, where they target impact oriented investors who buy stocks on traditional or dedicated green exchanges or focus on ETFs investing in green or low carbon stocks.

Green or low carbon stocks are stocks of companies with low or negative corporate carbon footprint. Example would be Google[18], carbon neutral since 2007, sourcing 100% of its energy needs by renewable energy since 2017, invested 2.5 billion USD to renewable energy projects; or companies whose products or services directly contribute to the switch to a low carbon economy (such as Tesla[19], whose "mission is to accelerate the world's transition to sustainable energy" by developing cutting edge power storage technology, manufacturing electric vehicles and piloting other low carbon transportation systems.

Regular exchanges increase the environmental reporting and disclosure requirements and securities are traded and listed in various ETFs and indices: Example would be BlackRock's iShares MSCI ACWI Low Carbon Target ETF or the First Trust's NASDAQ Clean Edge Green Energy Index Fund. Examples of dedicated green exchanges would be the Green Exchange Luxembourg or Green Exchange Chicago. Investors with double bottom line targets (return on investment as well as low or negative carbon footprint) are joining initiatives such as Portfolio Decarbonisation Coalition whose main mission is to mobilize financial markets to drive economic decarbonisation. Their motivation is often expressed as fundamental (do the right thing) and economical (to manage the risk of climate change, adaptation and carbon bubble[20] across their portfolios)

Early stage enterprises with environmental mission can also consider green venture capital. Investments into wind power are for example often considered as green venture capital as it is an emerging sector and

[18] Google on sustainability: https://environment.google/approach/

[19] Tesla's mission: https://www.tesla.com/about

[20] Carbon bubble is according to Jeff Rubin's Carbon Bubble book: "... bubble in the valuation of companies dependent on fossil-fuel-based energy production, because the true costs of carbon dioxide in intensifying global warming are not yet taken into account in a company's stock market valuation…" ISBN 978-0345814715, 2015

mostly led by startups who focus on production of power with zero emissions during the production phase.

Other type of financing can come from the debt capital markets, mostly consisting of green bonds and green loans.

Green Bonds

Green bonds as defined by Investopedia[21] are "Designated bonds intended to encourage sustainability and to support climate-related or other types of special environmental projects. More specifically, green bonds finance projects aimed at energy efficiency, pollution prevention, sustainable agriculture, fishery and forestry, the protection of aquatic and terrestrial ecosystems, clean transportation, sustainable water management and the cultivation of environmentally friendly technologies."

Green bond issuances are expected to exceed $250 billion this year, up from about $155 billion in 2017, according to Moody's. Companies are issuing green bonds to pay for projects that will save them money on power bills and show customers and investors they're serious about climate change.

Between the biggest underwriters[22] of green bonds belong Bank of America Merill Lynch, Credit Agricole CIB, HSBC or Citi.
Examples of corporations using green bonds as a source of financing are Starbucks Coffee ($495.5 million sustainability bond), Unilever (£250 million, 2% per cent Fixed Rate Notes), Toyota (four Green Bonds totaling $5.3 billion), or Apple ($2.5 billion in two issuances).

Green Loans

Green loans as defined by APLMA (Asia Pacific Loan Market Association) are "any type of loan instrument made available exclusively to finance or refinance, in whole or in part, new and/or existing eligible Green

[21] Investopedia on Green Bonds: https://www.investopedia.com/terms/g/green-bond.asp
[22] 2017, source: https://www.climatebonds.net/resources/league-table

Projects. Green loans must align with the four core components of the Green Loan Principles (GLP)[23]:
1. Use of Proceeds (for green projects as per Appendix 1 of the GLP)
2. Process for Project Evaluation and Selection (criteria for borrower's communication to lenders on the project green loan suitability)
3. Management of Proceeds (ensure transparency and accountability while allocating proceeds)
4. Reporting (project progress, impact reports, funds allocation,..)

According to the IFC estimate, in 2014 green loans financed $164 billion to projects with green activities, which represents 15% of total syndicated loans (1.1 trillion).

Green loans are disbursed by traditional commercial banks, mutual banks (EIB), or specialized green banks. Examples from the commercial banking are Green Investment Group of MACQUARIE (green bank), ING, Lloyds Banking Group, Barclays, or HSBC. Conditions of the loans vary, depending on the size of loan, repayment length, borrowers' financial health, type of project etc.

Using the example of EIB conditions for green loans, the allocation of proceeds is often limited to CAPEX and a subject of regular reporting. Drawing of the funds is flexible in timing (or released upon investment), loans do not have to be withdrawn fully and there are no fees for not withdrawing the full amount of loan if not necessary (as opposite to commercial loans). EIB also provides a free technical expert advisory on the projects.

Subsidies and post-emission-reduction financing

Third type of financing can be categorized as subsidies. Investopedia defines subsidies as a sum of money granted by the state or a public body to help an industry or business keep the price of a commodity or service low. Countries which commit to ambitious emission reduction goals make available a wide range of various public funds, distributed and accessible nationally or regionally.

[23] Green Loan Principles published by the Loan Market Association on 21 March 2018 : https://goo.gl/cKS5YY

For example the EU's LIFE Fund provides financing based on the REGULATION (EU) No 1293/2013. Fund supports environmental, nature conservation and climate action projects (existing or new ventures) throughout the EU. €3.4 billion to be disbursed between 2014-2020 and for the next long-term EU budget (2021-2027), the Commission is proposing to increase funding by almost 60%. From 2018 the EU implemented simplified project application procedure. Projects have to keep the Key Project Level Indicators of impact and provide a solid business plan to support its application. Fund is operating two instruments: Natural Capital Financing Facility (NCFF); Private Finance for Energy Efficiency instruments (PF4EE).

Secondly, often forgotten type of subsidies, are the market based subsidies. Result based financing in terms of green finance market enables the receivers to draw funds as a result of the documented or verified impact.

Similarly it is possible to co-finance the investments in decarbonisation via international carbon emissions market (post-emission-reduction financing) , where the participants design and implement emission reduction projects (under the Clean Development Mechanism (CDM), as defined in the Kyoto Protocol - IPCC 2007) based on prescribed methodologies and guidelines, register it with particular authority (UNFCCC), and if the reductions get verified (by third party verifiers), project participants are eligible for issuance of carbon credits (CER - Certified Emission Reduction credits), that can then be monetized via the international carbon market. So far over nearly 3 billion CER and ERU credits were issued, with equivalent tCO2e reduction. Participants of the carbon market then use the carbon credits for voluntary carbon offsetting or compliance purposes.

CDM is not the only source of possible financing coming from the carbon markets. EU Emission Trading Scheme for example allows the Member States under the DIRECTIVE (EU) 2018/410 to allocate free emission allowances (EUA) between 2020-2030 for industrial and energy sectors, conditioned by investments into carbon mitigation measures. The value will correspond to 450 million allowances (~$7.2 billion) The criteria for allocation will include demonstration of innovative technologies and breakthrough innovation in industry for allocation from EU ETS Innovation Fund. Investments in modernizing the power sector and

wider energy systems, boosting energy efficiency, and facilitating a just transition in carbon-dependent regions will be the criteria for EU ETS Modernization Fund.

Alternative Financing

Fourth type of emerging green financing could be defined as alternative. Green crowdfunding or green crowd investment organizations enable individuals or small investors donate or invest money in rather small scale projects ($10,000 -1 million) or early stage startups. This type of financing (however a negligible share in overall size of the green finance market) is becoming popular mainly because of the shift in values of new generations (Millennials, GenY) whose environmental cautiousness is gradually becoming stronger. Projects typically have to qualify but no extensive due diligence or verifications needed. Expected investor returns on capital vary from 0 to 20% in case of green venture capital platforms. Examples of such platforms include One Planet Crowd, GREENVOLVED, Green Crowd Funder, Greencrowd, WorthWild or Crowdfunders.

Practical Guideline For Selecting the right type of Green Financing

After not being aware of the possible financing variants, the companies often lack the knowledge on how to draw the funds or which type of financing is suitable for different scenarios and conditions. Below are listed the basic guidelines for accessing the green finances, using specific examples from each financing category.

Green Equity guidelines

Luxembourg Green Exchange allows securities listings following these steps:
First, the company has to find the stock underwriting bank, which will raise investment capital from investors on behalf of corporations that are issuing the equity.
Second step is to register at Luxembourg Green Exchange (by following online application, classification, transparency, disclosure, and reporting procedures).
Next the company issues so called Red Herring Prospectus (note circulating the upcoming stock issuance announcement)
The underwriter then organizes a Roadshow, approaching the potential investors and finally the IPO (Initial Public Offering) can take place.

Green Bonds guidelines

According to the procedure described by CERES (sustainability nonprofit organization working with the most influential investors and companies to build leadership and drive solutions throughout the economy) the green bonds can be issued in following steps:
The company first determines the purpose, size of issuance ($10 million USD up to $1.75 billion) and bond maturity (3-25 years).
Next steps are similar to green equity. Find underwriter (SEB, Bank of America / Merrill Lynch, Morgan Stanley, Credit Agricole, Deutsche Bank, Rabobank, JP Morgan), Red Herring, Roadshow and issuance of green bond.
Company then has to follow the procedures of reporting and disclosure of use of proceeds defined by the exchange, investors or regulator.

Green Loans guidelines

EIB joins for financing green loans of at least €50 million by up to 50% of the amount. The first step has to be to prepare project/business plan. Company then has to ensure financing of 50% of the project from other than EIB sources. Meanwhile the process of EIB due diligence (submit documents, project auditing) can be running. Participation of EIB on the project can mean a significant negotiation advantage for getting favorable commercial bank conditions on the project. Once the company receives a loan offer from EIB, contracts have to be signed and drawing of the funds can start.

Clean Development Mechanism of the UN guidelines

Companies or projects can get issued CER credits under the UNFCCC's CDM mechanism for verified emission reduction projects in certain sectors. These credits are issued only after the emission mitigation takes place. The procedure includes following main steps:
Before the project is implemented, the project developer has to submit Project Design Document (PDD) to CDM board. The PDD contains information on the project aim, methodology, scope, pre-implementation baseline of emissions, post-implementation reduction calculations, involved project participants etc. Next the project developer has to obtain an approval from Designated National Authority (usually ministry of environment, taking care of the country's Kyoto Protocol compliance and making sure to avoid double counting) Monitoring Plan and verification reports have to be submitted yearly. Following the verified emission reduction, the project developer can apply on UNFCCC website for issuance of the credits. CDM board issues CER credit yearly, according to the verification report and upon payment of the issuance fees. To receive the funding, the project developer then has to go to the carbon market to sell the credits. This usually happens directly via one of the commodity exchanges or OTC, using trading or brokerage houses.

Modernization and Innovation fund of the EU ETS guidelines

The DIRECTIVE (EU) 2018/410 provides a basic framework for the allocation of emission allowances to eligible projects from 2020 to 2030. Detailed process regulation shall be published by the EC by the end of 2019.

Prepare project (focus on value/price and emission reduction assessments), more details in DIRECTIVE (EU) 2018/410 and Regulation published by the end of 2019.
From the currently available information it is clear that first the companies have to submit request for up to 100% financing of the project (minimum value 12,5M euro) by free allowance allocation to the Ministry of Environment in relevant Member State (yearly bidding). Projects have to comply with the aim of the funds and with the project criteria. Once the allocation is granted, company can receive free allowances from the relevant Member State. The company then has to prove the use of finances (equivalent to = the number of allowances allocated* average price of EUAs auctioned in a year prior to allocation)

LIFE funds of the EU guidelines

To receive the funds from the LIFE funds of the EU the company has to apply via web portal of EC by March/April each year.
Application has two phases: 1.financial plan and division of sources of financing, 2.letter of intent from co-financing body.
Once the application is done, the company can receive and use the financing. Following the implementation of the project, the company has to measure, monitor and disclose yearly assessment of the projects' implementation and results.

Green Crowd Funder guidelines

To finance smaller projects, companies can choose a crowdfunding/crowd investment platform to raise equity or funds. In case of Green Crowd Funder the first step is to submit the application online. The Crowd Funding team will ask to cooperate on due diligence and business plan assessment/co-creation.
Here the success of the VC fund raising will depend on the quality of the promotional campaign and how the project appeals to the investors. So the next step is to prepare and run fundraiser campaign (PV term sheets and contracts, business plan, financials, summaries and visuals,..) Receive up to 80% equity share of post-money company value.

Decision Metrics For Suitability In Financing Type

Each of the mentioned types of financing has its own specifications and is suitable for different types of capital requirement.
Below are the 3 main decision metrics of criteria for selection:

- By size of required financing
- By business cycle
- By optimal capital structure

Decision metrics by size of required financing

	Green Equity	Green Bonds	Green Loans	Subsidies	Alternative
10k-300k	☐	☐	☐	☐	☑
300k-3M	☐	☐	☐	☑	☑
3M-300M	☐	☑	☑	☑	☐
300M-4B	☑	☑	☑	☐	☐

Exhibit A: decision metrics by size of required financing, in USD

The size of required financing should be an important decision factor. For financing projects below $0.3 million the company can consider alternative source of financing as none of the other types of financing is economically efficient in this case. For larger amounts ($0.3 - 3 million) the companies can consider either a combination or one of the options from subsidies or alternative sources. For $3-300 million the company can consider green bonds, green loans and/or subsidies. For amounts over $300 million the green loans, green bonds and green equity are suitable.

Decision metrics by business cycle

Stage	Green Equity	Green Bonds	Green Loans	Subsidies	Alternative
Pre-Startup	☐	☐	☐	☐	☑
Startup	☐	☐	☐	☑	☑
Growth	☑	☑	☑	☑	☐
Maturity	☑	☑	☑	☑	☐
Transformation	☑	☑	☑	☑	☐

Exhibit B: decision metrics by business cycle

The business cycle has 6 stages and different types of financing should be considered. For companies or emission mitigation projects in Pre-Startup stage companies can consider alternative sources of financing. Startup companies can consider using subsidies or alternative sources of financing. Green equity, green bonds, green loans or subsidies can be considered by companies in Growth, Maturity or Transformation stage.

Decision metrics by optimal capital structure

	Green Equity	Green Bonds	Green Loans	Subsidies	Alternative
Debt	☐	☑	☑	☐	☑
Equity	☑	☐	☐	☐	☑
Donation	☐	☐	☐	☑	☑

Exhibit C: decision metrics by optimal capital structure

Investopedia describes optimal capital structure as the best mix of debt, preferred stock and common stock that maximizes a company's stock price by minimizing its cost of capital.
Once the company calculates the optimal capital structure, it can choose from available forms of financing that suit the criteria. Green bonds and green loans as well as green crowd investment platforms provide source of financing by debt. Green equity and green venture capital and green crowdfunding platforms are a source of equity funding. Donations can be raised via green crowdfunding platforms or state or market subsidies.

Conclusions

The green finance market is undeniably on a rise, supported by a strong push by the policy makers and key finance market stakeholders. The options for financing the transformation for a low carbon economy are widening and companies should maximize their benefit from this development.

As of 2018, the investments into low carbon transformations are fundamentally needed (to ensure the survival of planet), required by policy (as a result of ambitious climate goals by 198 states signing the Paris Agreement) and economically sensible (saving costs, contributing to portfolio and business risk management, increasing profitability, enabling to benefit from favorable conditions of green financing).

The role of the money market is to enable access to financing for those companies, who acknowledge and choose to follow these trends.

Depending on the aim, size of required financing, business cycle and optimal capital structure companies can choose from various types of financing. Green equity, green bonds and green loans are showing an impressive growth in the past few years. With the country level climate ambitions the state subsidies increase in significant amounts and world spread carbon market mechanisms contribute in financing by efficient climate finance allocation. Interest in financing the low carbon transformation is even spreading beyond the money market, to private participants via crowdfunding and crowd investment platforms.

The access to green financing is still in a development stage. To maximize the impact of green finance, the companies first have to be aware of the available variants, choose wisely and make sure to comply with the eligibility criteria. In each case, green finance provides valuable financing opportunities and should be considered by companies who contribute to the transition to a low carbon economy.

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