General Application

(The General Application applies to everyone, all applicants should complete this)

Company or organization name

Out of the blue

Company or organization location (we welcome applicants from anywhere in the world)

London

Name of person filling out this application

Lennart Joos

Email address of person filling out this application

lennart@co2outoftheblue.com

Brief company or organization description

Removing CO2 from the sea: safely, cheaply, scalably

1. Overall CDR solution (All criteria)

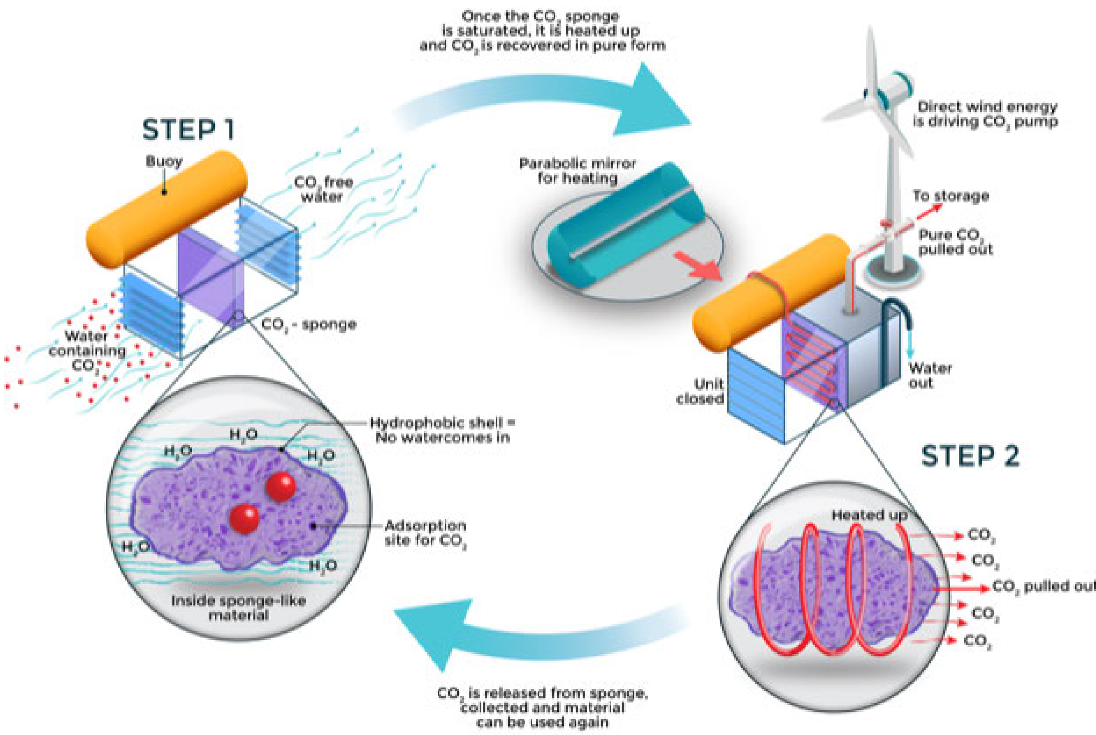
a. Provide a technical explanation of the proposed project, including as much specificity regarding location(s), scale, timeline, and participants as possible. Feel free to include figures.

Out of the blue is a start-up with a mission to remove CO2 from the ocean in a safe, cost-effective and large-scale manner.

We use filters that capture CO2 in seawater and then store the CO2 underground. This approach has the advantage of tackling both ocean acidification and climate change. The technology we use is based on an adsorption-desorption process of CO2 in a selective porous filter material (think of it as Climeworks-in-the-Sea), as shown in the following Figure. *Out of the blue* is the first company in the world to use this method (patent submitted) and we are now seeking Stripe's help to develop a first pilot of the technology.

Technology in detail:

The porous filter material acts as a hydrophobic CO2 sponge: it is placed in a container, suspended just below the waterline using buoys. Water is allowed to naturally flow through the unit, where the material will take up the CO2 from the water. Once saturated, the material can be regenerated in a second step by closing off the volume and applying heat or vacuum. This releases pure CO2 and the empty filter material, which can be used 1000s of times. Ideally, we want to use direct renewable energy for this step: heating using parabolic mirrors heating a working fluid, or a wind turbine mechanically driving a vacuum pump without converting the wind energy to electricity first.



There are several possibilities for the adsorbent filter, but we will start with post-functionalized activated carbon. In general, porous carbons are rather hydrophobic, are selective for CO2 adsorption, have a high CO2 adsorption capacity and have low affinity for other gases dissolved in water - though these properties will have to be optimised by slightly modifying the adsorbent. Additionally, activated carbon is cheap, readily available in large quantities, and is a net CO2 negative material.

This makes a wonderful full circle: we are using a material that is itself storing CO2, to extract even more CO2 from the environment.

We believe this technological concepts provides major advantages over other technologies:

1. Lower operating costs:
    a. Natural convection of the ocean will suffice in moving around the water, as volumetric concentration of CO2 in the sea is 150 times that of in the air
    b. Regeneration energy cost may be up to 4 times lower compared to Direct Air Capture: there is no need for strong, selective CO2 adsorption sites in the filter material, as CO2 is dissolved in much higher quantities than oxygen or nitrogen.
    c. The ocean boasts an extremely large capacity for renewable energy, in both wind, tidal, wave and solar. These can be used directly in the process as well.

2. Local advantages:
    a. There are marketable advantages to improving water quality locally
    b. The process only removes the CO2, which makes it safer than Enhance Weathering (leakage of trace elements), forced algae bloom (difficult to control) or alkalinization (locally too high pH's)
    c. Alternatively, these installations can be anchored as islands to drilling platforms of depleted oil & gas wells, which can be used for reinjection of CO2 underground, cutting out the transport cost

It should be stressed that *out of the blue* is currently still in its infancy. Further development needs to be done in order to make this a commercial process. However, we feel that we are caught in several chicken-or-egg situations: It's difficult to get funding if you don't have customers, but we can't get customers without funding for our technology. We don't know how this technology will work at large scale and relevant conditions, but we can't know until we get started... Our hope is that this application can somewhat break this gridlock, so that we can do what needs to be done: get started with this promising novel technology.

For the sake of this application, we are trimming down the process to an early lab scale version. That means we will work:

1. In idealised circumstances, with clean water and under controlled CO2 levels
2. Without access to true ambient CO2 nor permanent geological storage
3. We will remove 100kg of CO2 in lab conditions, and convert it into an art installation (in collaboration with an artist); furthermore, we will use 100kg of CO2 in the form of biochar as the adsorbent, which will be disposed of appropriately.

b. What is your role in this project, and who are the other actors that make this a full carbon removal solution? *(E.g. I am a broker. I sell carbon removal that is generated from a partnership between DAC Company and Injection Company. DAC Company owns the plant and produces compressed CO_2. DAC Company pays Injection Company for storage and long-term monitoring.)*

Out of the blue is the deep-tech company that is developing a novel ocean-CDR technology, and that will actively be removing CO2, as well as selling it both B2B and B2C. For the permanent geological storage, which we envision as the final destination for the CO2 problem, we will in the future work with underground CO2 storage providers.

c. What are the three most important risks your project faces?

Team:
In the coming months, assembling a team will be crucial in order to build out this project. However, building a team is not an exact science, especially under the current circumstances, where it is difficult to meet people in normal circumstances.

Technological:
Before the CO2 can actually be removed, more technology development is necessary. Although the process should in principle work, there may be hurdles that cannot be overcome in time or budget. Here, this novel technology differs from biological approaches (where little technology development is needed), or Direct Air Capture (where one can build on decades of previous research).

Financial:
So far, out of the blue has not secured external investments, which makes the future of the business uncertain. There are some positive signals though, among them that out of the blue was selected to participate in Cambridge-based climate-focussed start-up incubator Carbon13.

d. If any, please link to your patents, pending or granted, that are available publicly.

No publicly available patent, but one patent submitted and in progress:
EP20158971
Will be made available when appropriate.

2. Timeline and Durability (Criteria #4 and Criteria #5)

a. Please fill out the table below.

	Timeline for Offer to Stripe
Project duration *Over what duration will you be actively running your DAC plant, spreading olivine, growing and sinking kelp, etc. to deliver on your offer to Stripe? E.g. Jun 2021 - Jun 2022. The end of this duration determines when Stripe will consider renewing our contract with you based on performance.*	June 2021-June 2022

When does carbon removal occur? *We recognize that some solutions deliver carbon removal during the project duration (e.g. DAC + injection), while others deliver carbon removal gradually after the project duration (e.g. spreading olivine for long-term mineralization). Over what timeframe will carbon removal occur?* *E.g. Jun 2021 - Jun 2022 OR 500 years.*	January 2022 - June 2022
Distribution of that carbon removal over time *For the time frame described above, please detail how you anticipate your carbon removal capacity will be distributed. E.g. "50% in year one, 25% each year thereafter" or "Evenly distributed over the whole time frame". We're asking here specifically about the physical carbon removal process here, NOT the "Project duration". Indicate any uncertainties, eg "We anticipate a steady decline in annualized carbon removal from year one into the out-years, but this depends on unknowns re our mineralization kinetics".*	In the first 6 months of the project, we will build a lab-scale pilot installation. We expect the production of CO2 removal to ramp up throughout the next 6 months, upon eliminating child diseases from the technology.
Durability *Over what duration you can assure durable carbon storage for this offer (e.g, these rocks, this kelp, this injection site)? E.g. 1000 years.*	>1000 years (especially in view of the the long term strategy)

b. What are the upper and lower bounds on your durability claimed above in table 2(a)?

>1000 years

c. Have you measured this durability directly, if so, how? Otherwise, if you're relying on the literature, please cite data that justifies your claim. *(E.g. We rely on findings from Paper_1 and Paper_2 to estimate permanence of mineralization, and here are the reasons why these findings apply to our system. OR We have evidence from this pilot project we ran that biomass sinks to D ocean depth. If biomass reaches these depths, here's what we assume happens based on Paper_1 and Paper_2.)*

In the long run, *out of the blue* focusses on permanent geological storage. Although we will likely have to work with third parties, injection into geological reservoirs and saline aquifers is

well understood and there is an increasing body of data showing that long-term storage is reachable. We are aware that in this application, we are not selling our final solution, and the durability of this lab-scale solution is imperfect. However, we can commit to geologically restore the full amount from this proposal when our technology is mature. For the sake of this application, there are two parts: 1) The 100kg of CO2 stored in the biochar adsorbent will be disposed of in a way that no CO2 is released. In all likeliness, we will wash the biochar to then be spread out in a field 2) The 100kg of CO2 captured with the process will be turned into an artwork, in collaboration with an artist. In all likeliness, it will be mineralized into a carbonate form. The emissions associated with the creation of the artwork will be offset separately.

d. What durability risks does your project face? Are there physical risks (e.g. leakage, decomposition and decay, damage, etc.)? Are there socioeconomic risks (e.g. mismanagement of storage, decision to consume or combust derived products, etc.)? What fundamental uncertainties exist about the underlying technological or biological process?

For the sake of this application: 1) The end-of-life of the biochar is not completely clear on the long term 2) For any mineralized products, there is no danger of leakage, and these products can be considered stable. In the longer term, we plan to work with providers of geological storage.

e. How will you quantify the actual permanence/durability of the carbon sequestered by your project? If direct measurement is difficult or impossible, how will you rely on models or assumptions, and how will you validate those assumptions? *(E.g. monitoring of injection sites, tracking biomass state and location, estimating decay rates, etc.)*

For this first project, the permanence will be guaranteed since it will involve mineralizing the CO2 but upon deployment at large scale, we will work with providers of geological storage (e.g. Northern Lights) that will ensure the durability.

3. Gross Capacity (Criteria #2)

a. Please fill out the table below. **All tonnage should be described in metric tonnes here and throughout the application.**

	Offer to Stripe (metric tonnes CO_2) over the timeline detailed in the table in 2(a)

Gross carbon removal Do not subtract for embodied/lifecycle emissions or permanence, we will ask you to subtract this later	0.2 tCO2
If applicable, additional avoided emissions e.g. for carbon mineralization in concrete production, removal would be the CO_2 utilized in concrete production and avoided emissions would be the emissions reductions associated with traditional concrete production	0

b. Show your work for 2(a). How did you calculate these numbers? If you have significant uncertainties in your capacity, what drives those? *(E.g. This specific species sequesters X tCO_2/t biomass. Each deployment of our solution grows on average Y t biomass. We assume Z% of the biomass is sequestered permanently. We are offering two deployments to Stripe. X*Y*Z*2 = 350 tCO_2 = Gross removal. OR Each tower of our mineralization reactor captures between X and Y tons CO_2/yr, all of which we have the capacity to inject. However, the range between X and Y is large, because we have significant uncertainty in how our reactors will perform under various environmental conditions)*

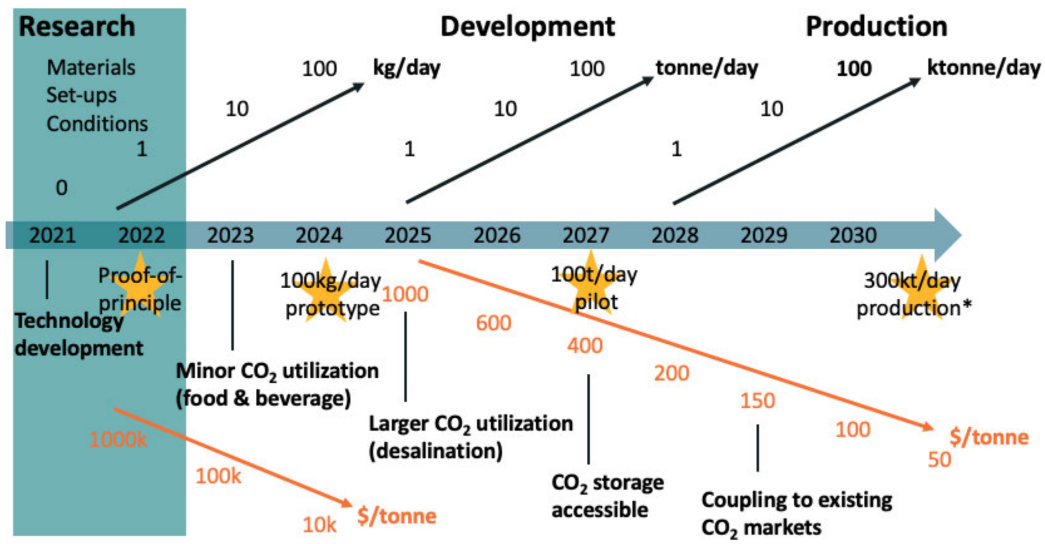
The advantage of engineered approaches to CO2 removal for geological sequestration, is that there are two measurements available to assess the total CO2 removed: ADSORPTION PHASE: the amount of CO2 removed from the ocean can be calculated from the change in pH (removal of acidity) and the flow of seawater through the unit. DESORPTION PHASE: the amount of CO2 recovered can be evaluated from the flow and purity of the CO2 measured in the regeneration step. Before final storage, the flows through the piping can easily and accurately be certified by third parties

c. What is your total overall capacity to sequester carbon at this time, e.g. gross tonnes / year / (deployment / plant / acre / etc.)? Here we are talking about your project / technology as a whole, so this number may be larger than the specific capacity offered to Stripe and described above in 3(b). We ask this to understand where your technology currently stands, and to give context for the values you provided in 3(b).

0 metric tonnes CO_2/yr

It is important to point out that *out of the blue* is a starting venture. We are participating in this application precisely to be able to kick off further development. Over the last 1.5 year, we have noticed that we are in a valley of death: a prerequisite for funding is to have a pilot installation, but in order to build a pilot installation… we need funding. We are participating because we believe this application could bridge that valley by providing early traction.

Below, we are showing a path for scale-up we want to follow. We are at the very beginning of the journey, and the most important action now is: to get started!



d. We are curious about the foundational assumptions or models you use to make projections about your solution's capacity. Please explain how you make these estimates, and whether you have ground-truthed your methods with direct measurement of a real system (e.g. a proof of concept experiment, pilot project, prior deployment, etc.). We welcome citations, numbers, and links to real data! *(E.g. We assume our sorbent has X absorption rate and Y desorption rate. This aligns with [Sorbent_Paper_Citation]. Our pilot plant performance over [Time_Range] confirmed this assumption achieving Z tCO_2 capture with T tons of sorbent.)*

It is precisely to assess these basic data that we need to build a first pilot installation. However, we have done small-scale tests using industrial CO2 dissolved in water and captured it with activated carbon filters and measured the reduced Ph in the water, proving that the filters indeed remove CO2.

e. Documentation: If you have them, please provide links to any other information that may help us understand your project in detail. This could include a project website, third-party documentation, project specific research, data sets, etc.

The main challenge as well as the core opportunity of *out of the blue*, is that the technology doesn't exist as of today. That means we can't offer references to scientific literature, but it also means that there is an ocean of possibility ahead.

- https://co2outoftheblue.com
- https://www.researchgate.net/profile/Lennart-Joos/publications
  (research profile of *out of the blue*'s founder Lennart Joos)

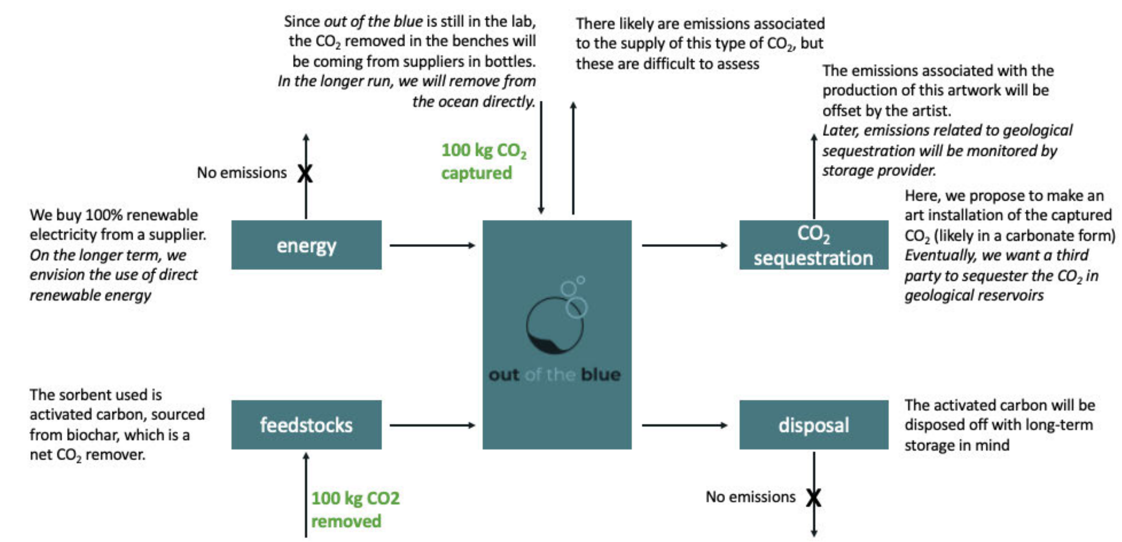
4. Net Capacity / Life Cycle Analysis (Criteria #6 and Criteria #8)

a. Please fill out the table below to help us understand your system's efficiency, and how much your lifecycle deducts from your gross carbon removal capacity.

	Offer to Stripe (metric tonnes CO_2)
Gross carbon removal	*Should equal the first row in table 3(a)* 0.2tCO2
Gross project emissions	*Should correspond to the boundary conditions described below this table in 4(b) and 4(c)* Assumed to be 0 (see below)
Emissions / removal ratio	*Gross project emissions / gross carbon removal: should be less than one for net-negative carbon removal systems, e.g. the amount emitted is less than the amount removed* For this project application: assumed to be 0 In the longer run: likely ±90%
Net carbon removal	*Gross carbon removal - Gross project emissions* 0.2tCO2

b. Provide a carbon balance or "process flow" diagram for your carbon removal solution, visualizing the numbers above in table 4(a). Please include all carbon flows and sources of energy, feedstocks, and emissions, with numbers wherever possible *(E.g. see the generic diagram below from the CDR Primer, Charm's application from last year for a simple example, or CarbonCure's for a more complex example).* If you've had a third-party LCA performed, please link to it.

In this Figure, both short- and long term perspectives are given. We will need more data from pilot runs to be able to provide the additional numbers. At the end of the project, we are happy to open-source high-level data.



c. Please articulate and justify the boundary conditions you assumed above: why do your calculations and diagram include or exclude different components of your system?

- Inclusion of CO2 removal from biochar: because we believe this is an important facet of the technology: to use an adsorbent that is itself carbon negative.
- Exclusion of emissions associated with CO2 sequestration: Only for now. There will be emissions associated with this part, that will later be verified by a storage provider.
- Exclusion of emission associated with energy: because in the long term, we envision stand-alone systems, using as much direct renewable energy as possible.

d. Please justify all numbers used in your diagram above. Are they solely modeled or have you measured them directly? Have they been independently measured? Your answers can include references to peer-reviewed publications, e.g. Climeworks LCA paper.

The numbers will be measured directly, but need verification.

e. If you can't provide sufficient detail above in 4(d), please point us to a third-party independent verification, or tell us what an independent verifier would measure about your process to validate the numbers you've provided. (We may request such an audit be performed.)

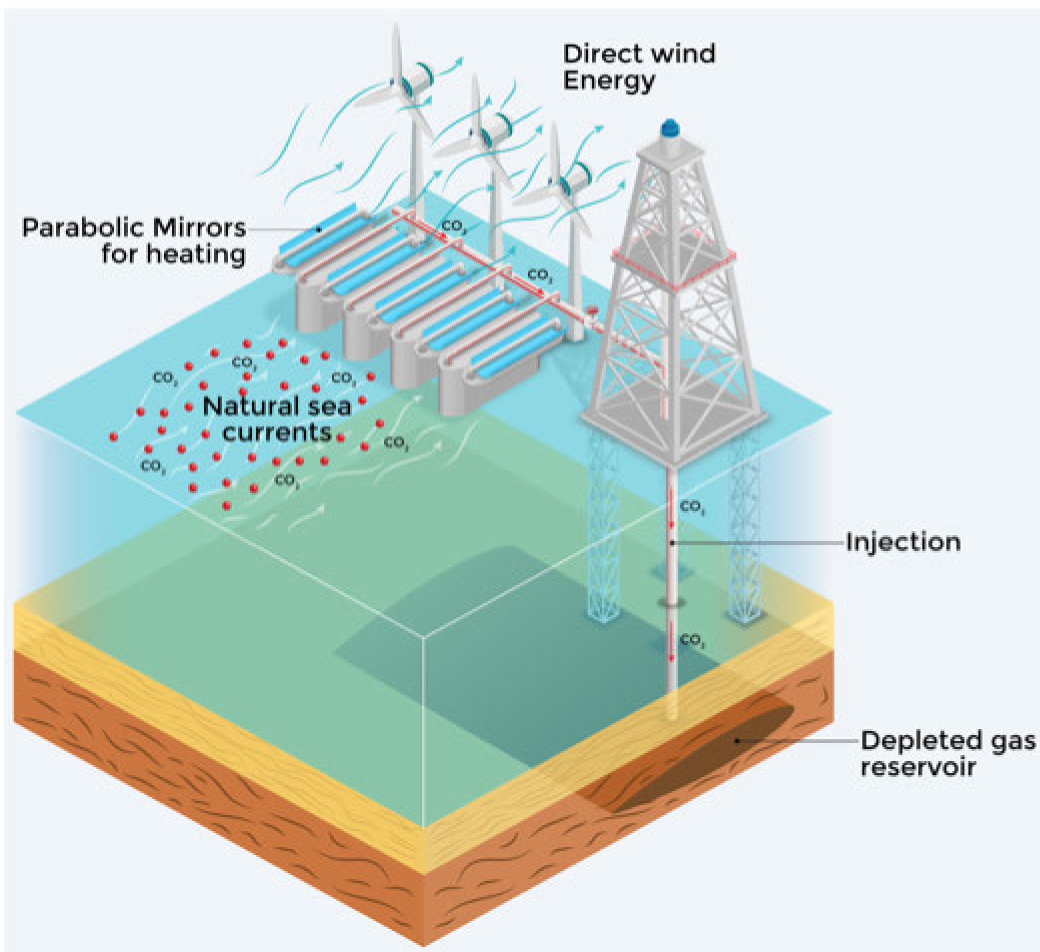
Since the quantities will be so low, we will be able to physically show them. However, we will gather all necessary data in our runs, to provide more detail in the future. We can provide certain data at the end of the project as a part of the contract as well.

5. Learning Curve and Costs (Backward-looking) (Criteria #2 and #3)

We are interested in understanding the learning curve of different carbon removal technologies (i.e. the relationship between accumulated experience producing or deploying a technology, and technology costs). To this end, we are curious to know how much additional deployment Stripe's procurement of your solution would result in. (There are no right or wrong answers here. If your project is selected we may ask for more information related to this topic so we can better evaluate your progress.)

a. Please define and explain your unit of deployment. (*E.g.* # of plants, # of modules) *(50 words)*

Out of the blue envisions a modular system that can be clustered together in floating islands. The modular approach facilitates scalability, shifting the challenge to producing enough units. The price per captured tonne will fall quickly when production is ramped up and we foresee a price of under 50 USD per tonne as a possibility.



b. How many units have you deployed from the origin of your project up until today? Please fill out the table below, adding rows as needed. Ranges are acceptable if necessary.

Year	Units deployed (#)	Unit cost ($/unit)	Unit gross capacity (tCO_2/unit)	Notes
2021	1	200000	1kg/unit/day	Stripe's contribution will essentially allow us to build the first pilot installation
2020	0	n/a	n/a	Despite widely looking for funding or collaborations, little progress
2019	0	n/a	n/a	Out of the blue was founded in September 2019
...				

c. Qualitatively, how and why have your deployment costs changed thus far? *(E.g. Our costs have been stable because we're still in the first cycle of deployment, our costs have increased due to an unexpected engineering challenge, our costs are falling because we're innovating next stage designs, or our costs are falling because with larger scale deployment the procurement cost of third party equipment is declining.)*

n/a

d. How many additional units would be deployed if Stripe bought your offer? The two numbers below should multiply to equal the first row in table 3(a).

# of units	Unit gross capacity (tCO_2/unit)
1	0.2 tCO_2/unit

6. Cost and Milestones (Forward-looking) (Criteria #2 and #3)

We ask these questions to get a better understanding of your growth trajectory and inflection points, there are no right or wrong answers. If we select you for purchase, we'll expect to work with you to understand your milestones and their verification in more depth.

a. What is your cost per ton CO_2 today?

1 000 000 \$/ton CO_2 The cost is not for deployment of the technology but the costs of setting up a lab and producing the first pilot. We foresee a long term cost of **less than 50 USD per tonne (excl. storage) when the method is mature and deployed at large scale.**

b. Help us understand, in broad strokes, what's included vs excluded in the cost in 6(a) above. We don't need a breakdown of each, but rather an understanding of what's "in" versus "out."

As is the case for all technologies: the first unit is the most expensive. This is the first unit.

It contains:

- R&D costs: still high at this stage, includes all kinds of general lab equipment that still need to be bought.
- Material costs: to build the pilot, we need to build and constantly adapt a pilot installation, as well as develop an optimal sorbent.
- Labour cost: the first tests will require constant oversight and frequent interventions by technicians.
- Energy costs: in the first stage, focus will be on maximal CO2 removal, not on maximal energy efficiency.

c. List and describe **up to three** key upcoming milestones, with the latest no further than Q2 2023, that you'll need to achieve in order to scale up the capacity of your approach.

Milestone #	Milestone description	Why is this milestone important to your ability to scale? (200 words)	Target for achievement (eg Q4 2021)	How could we verify that you've achieved this milestone?
1	Assembling a team to run this project.	To develop the process and build new generations of CO2 removal pilots	2021Q2	Payroll
2	Setting up a lab to start building the pilot installation	We need minimal infrastructure to build the first pilot in	2021Q3	Visual evidence, lab tour
3	Building the pilot installation ready to run	We need to build this first pilot in order to start removing CO2	2022Q1	Visual evidence, lab tour

i. How do these milestones impact the total gross capacity of your system, if at all?

Milestone #	Anticipated total gross capacity prior to achieving milestone (ranges are acceptable)	Anticipated total gross capacity after achieving milestone (ranges are acceptable)	If those numbers are different, why? (100 words)
1	0	0	n/a
2	0	0	n/a
3	0	0.2	This is where the actual work happens

d. How do these milestones impact your costs, if at all?

Milestone #	Anticipated cost/ton prior to achieving milestone (ranges are acceptable)	Anticipated cost/ton after achieving milestone (ranges are acceptable)	If those numbers are different, why? (100 words)
1	n/a	n/a	n/a
2	n/a	n/a	n/a
3	n/a	1 000 000$/tonne	This is where the actual work happens

e. If you could ask one person in the world to do one thing to most enable your project to achieve its ultimate potential, who would you ask and what would you ask them to do?

Angela Merkel, to make it easier for beginning European start-up founders to access laboratories (e.g. universities or national labs), and get a seed budget to adapt them to their needs.

f. Other than purchasing, what could Stripe do to help your project?

We are well aware that *out of the blue* is an early venture and that this application does not offer high-quality Carbon Removal. However, any support is welcome and spreading the word about the method and our needs is equally important for our project to succeed.

7. Public Engagement and Environmental Justice (Criteria #7)

In alignment with Criteria 7, Stripe requires projects to consider and address potential social, political, and ecosystem risks associated with their deployments. Projects with effective public engagement tend to do the following:

- Identify key stakeholders in the area they'll be deploying
- Have some mechanism to engage and gather opinions from those stakeholders and take those opinions seriously, iterating the project as necessary.

The following questions are for us to help us gain an understanding of your public engagement strategy. There are no right or wrong answers, and we recognize that, for early projects, this work may not yet exist or may be quite nascent.

a. Who are your external stakeholders, where are they, and how did you identify them?

> *Out of the blue* is active in networks related to ocean protection. We are not in full-scale production yet, but want to make sure the process is understood and accepted by the community.

b. If applicable, how have you engaged with these stakeholders? Has this work been performed in-house, with external consultants, or with independent advisors?

> We want to engage directly as much as possible.

c. If applicable, what have you learned from these engagements? What modifications have you already made to your project based on this feedback, if any?

> Once we have data to share, we will do so, to make sure to acquire the necessary feedback.

d. Going forward, do you have changes planned that you have not yet implemented? How do you anticipate that your processes for (a) and (b) will change as you execute on the work described in this application?

> n/a

e. What environmental justice concerns apply to your project, if any? How do you intend to consider or address them?

> *Out of the blue* puts safety above all else: the CO_2 problem is so gigantic, that any solution to it cannot contain secondary problems, or else they will blow up in our face. We believe we are less invasive to the environment and its ecosystems than many other solutions, but we strive towards continuous improvement and open communication with all stakeholders.

11. Legal and Regulatory Compliance (Criteria #7)

a. What legal opinions, if any, have you received regarding deployment of your solution?

None so far.

b. What permits or other forms of formal permission do you require, if any? Please clearly differentiate between what you have already obtained, what you are currently in the process of obtaining, and what you know you'll need to obtain in the future but have not yet begun the process to do so.

None so far.

c. In what areas are you uncertain about the legal or regulatory frameworks you'll need to comply with? This could include anything from local governance to international treaties. For some types of projects, we recognize that clear regulatory guidance may not yet exist.

There is a lot of discussion about CO2 removal from the sea at the moment, we hope to gain a better insight in the near future, but are convinced we don't have the luxury to wait for the final verdict.

12. Offer to Stripe

This table constitutes your offer to Stripe, and will form the basis of our expectations for contract discussions if you are selected for purchase.

	Offer to Stripe
Net carbon removal (metric tonnes CO_2)	0.2 tCO2
Delivery window (at what point should Stripe consider your contract complete?)	June 2021-June 2022
Price ($/metric tonne CO_2) ***Note on currencies:*** *while we welcome applicants from anywhere in the world, our purchases will be executed exclusively in USD ($).*	1 000 000 $/tonne

Application Supplement: Ocean

(Only fill out this supplement if it applies to you)

Physical Footprint (Criteria #1)

1. Describe the geography of your deployment, its relationship to coastlines, shipping channels, other human or animal activity, etc.

On the long term, *out of the blue* sees the greatest potential in anchoring/clustering CO2 extraction islands to decommissioned oil & gas infrastructure. This allows to cut long-distance transport of CO2, and has the advantage that there is plenty of space in the open seas.

Before that, we will use land-based infrastructure where sea water is already pumped around, e.g. desalination plants, cooling water, tidal plants etc. The obvious advantage being that it is much more accessible and there are no erratically moving parts.

2. Please describe your physical footprint in detail. Consider surface area, depth, expected interaction with ocean currents and upwelling/downwelling processes, etc.
    a. If you've also filled out the Biomass supplement and fully articulated these details there, simply write N/A.

Out of the blue is developing a technology that is a *un-invasive* as can possibly be
- CO2 is purely removed - nothing is added to the water. No bases or trace minerals.
- While the pH rises slightly, the change is subtle, and the water will quickly be mixed.
- The equipment will be floating on top of the water, reaching no more than 5 meter deep.
- There is no downwelling, the whole process doesn't disturb any natural oceanic processes.

3. Imagine, hypothetically, that you've scaled up and are sequestering 100Mt of CO_2/yr. Please project your footprint at that scale, considering the same attributes you did above (we recognize this has significant uncertainty, feel free to provide ranges and a brief description).
    a. If you've also filled out the Biomass supplement and fully articulated these details there, simply write N/A.

See point 2. The footprint will be as minimal as can be.

Potential to Scale (Criteria #2 and #3)

4. Building large systems on or in the ocean is hard. What are your core engineering challenges and constraints? Is there any historical precedent for the work you propose?

It is hard indeed. The closest historical precedent can be found in the oil & gas, and shipping industry. The modular approach of out of the blue somewhat mitigates the risk, in that, if it works for 1 module, it will work for thousands of modules.

Externalities and Ecosystem Impacts (Criteria #7)

5. How will you quantify and monitor the impact of your solution on ocean ecosystems, specifically with respect to eutrophication and alkalinity/pH, and, if applicable, ocean turbidity?

Obviously, this will be monitored in detail once the system is ready for real-life conditions. But again, the impact will be as low as can possibly be when removing CO2 from the ocean.

Application Supplement: Geologic Injection

(Only fill out this supplement if it applies to you)

Feedstock and Use Case (Criteria #6 and 8)

1. What are you injecting? Gas? Supercritical gas? An aqueous solution? What compounds other than C exist in your injected material?

This is not applicable to this application, but we propose to inject CO_2 in a supercritical state into geological reservoirs.

2. Do you facilitate enhanced oil recovery (EOR), either in this deployment or elsewhere in your operations? If so, please briefly describe. Answering Yes will not disqualify you.

No. *Out of the blue* vehemently opposes Enhanced Oil Recovery - this technology is moving the CO_2 needle in the wrong direction, and is not in line with the acute nature of the climate emergency. Moreover, we have serious objections with regards to environmental justice for EOR.

Throughput and Monitoring (Criteria #2, #4 and #5)

3. Describe the geologic setting to be used for your project. What is the trapping mechanism, and what infrastructure is required to facilitate carbon storage? How will you monitor that your permanence matches what you described in Section 2 of the General Application?

This is not applicable for this application, but we will work with storage providers (such as the Northern Light project). They have decades of expertise in this field, and we will work with them to ensure that all CO_2 storage is done at the highest possible levels of safety and permanence.

4. For projects in the United States, for which UIC well class is a permit being sought (e.g. Class II, Class VI, etc.)?

n/a

5. At what rate will you be injecting your feedstock?

n/a

Environmental Hazards (Criteria #7)

6. What are the primary environmental threats associated with this injection project, what specific actions or innovations will you implement to mitigate those threats, and how will they be monitored moving forward?

n/a

7. What are the key uncertainties to using and scaling this injection method?

n/a