Background Information

Introductory Questions:

- How did you hear about Climate Vault's RFP for grant funding?
    - Climate Vault website
- Has your organization previously applied to Climate Vault's RFP for grant funding?
    - No

Organization Information

- Name
    - Pina Technologies GmbH
- Location
    - Munich, Bavaria, Germany
- Brief description
    - Pina Earth is an innovative developer of certified climate projects in Europe. Using artificial intelligence, the company is supported by Y-Combinator, the German government and European Space Agency (ESA).

Applicant Information

- Name
    - Dr Gesa Biermann
- Email address
    - gesa.biermann@pina.earth
- Relationship to company / organization
    - Co-Founder & CEO

Project Overview

- Locations
    - Luckaitz Valley, Brandenburg, Germany (Latitude: 51.664449, Longitude: 13.944473)
    - Schlegel, Thüringen, Germany (Latitude: 50.421002, Longitude: 11.572986)
- Brief description of the CDR solution
    - Our climate projects save ecosystems by turning monocultures into climate-resilient and biodiverse forests which remove additional CO2. Our

solution is available today and scalable through our brand-new AI-based simulation.
- Has your project been approved under an existing standard / methodology?
    - Yes. [ISO 14064-2, TÜV Nord Cert GmbH (an accredited Verra VVB); link to PDD (password: …)](#)

Innovation

- Please provide a detailed explanation of the technology being utilized and the processes involved in your CDR solution. You may include up to three supporting figures.
    - One of the most important types of climate projects does not yet exist today. A large number of projects covers afforestation, reduced logging and forest protection.

        However, there are no established projects that cover climate risks instead of deforestation risks. These climate risks include droughts, storms and pests and already affect large parts of forests worldwide. Pina Earth fills this gap, doing ecosystems restoration by turning endangered monoculture forests into mixed and future-proof forests which remove additional carbon from the atmosphere.

        The potential of this project type is significant. More than 60% of forest biomass is at climate risk in the European Union [1] and more than 500.000 hectares of forest has already died in Germany since 2018 [2].

        As an innovative developer of certified climate projects in Europe, Pina Earth uses artificial intelligence and remote sensing data to calculate the carbon stock and offer high quality carbon removals to buyers.

        Our technology works as follows:

        First, we create a digital twin of the forest: We use forest owners' terrestrial inventory data which is the same data used for the German federal tax office and if required, fuse it with aerial remote sensing data (multispectral camera images with infrared data and LiDAR scans) from public authorities. In this way, we achieve 100% area coverage to detect and measure tree heights, crown area, etc.

        Second, we use this digital twin data as the input for our AI-based simulation to forecast forest growth under climate change 30 years into the future. The simulation is run twice, once with the business-as-usual forest management setting and once for the forest adaptation scenario which project activities such as planting of climate-resilient tree species, stimulating natural rejuvenation, and improving wildlife management.

        Third, we calculate the carbon credit volume based on the difference between the two simulated scenarios. After starting the project, the project areas

are monitored frequently using a combination of additional terrestrial and/or aerial data. This data is used to update the digital twin of the forest and to compare the calculated with the actual carbon removal amount.

For our approach, we use the latest technologies and scientific approaches from the emerging field of climate modeling. The groundbreaking character of the research in this field was recognized with the 2021 Nobel Prize in Physics for Syukuro Manabe's modeling of Earth's climate and global warming. We developed a brand-new, AI-based simulation that allows us to predict forest growth and carbon stocks under climate change impacts for more than 30 years into the future. This simulation takes into account varying combinations of tree species and provides detailed recommendations for forest owners to adapt their forests in the most climate-resilient way. To make use of these adaptations in the most profitable way, our service enables small forest owners to get access to the voluntary carbon market, a process which was formerly too costly, complex, and time-consuming.

To conclude, we have volumes issued available today. This proofs that our solution works reliable, in a cost effective and highly scalable way. Additionality is high and the risks of leakage low, which makes our solution the ideal complementation to technological carbon removal solutions.

Sources:
- [1] European Commission, 2021 (https://joint-research-centre.ec.europa.eu/jrc-news/more-half-europes-forests-vulnerable-climate-related-hazards-study-finds-2021-02-23_en)
- [2] German Government, 2021 (https://www.bmel.de/SharedDocs/Downloads/DE/Broschueren/waldbericht2021.pdf?__blob=publicationFile&v=11)

- What is your company / organization's role in this project?
  - Pina Earth is responsible for methodology development, data-driven project development, creation of project design document and organization of validation and verification.
- Are there other actors that make this project a full carbon removal solution? If so, please identify each actor and describe their role.
  - Organizations involved:

    - Pina Earth Technologies Gmbh: methodology development, data-driven project development, creation of project design document and organization of validation and verification. Pina Earth's team consists of experts in forestry, data science, software engineering, carbon markets and management leading in their respective fields.
    - TÜV Nord Cert GmbH: auditing the methodology, as well as validating and verifying the project. Being an internationally established validation and

verification body accredited by Verra, TÜV Nord acts as independent third-party auditor for the projects of Pina Earth.
- Boscor Gruppe GmbH: implementing the project activities. Boscor is a leading forest management provider in Germany and a thought leader for sustainable forest adaptation. As the largest forest management company in Germany, they have the capacity, skill and experience to implement the planned forest adaptation activities in a reliable manner.
- Forest Owner: ensuring that carbon removal takes place and project activities are implemented. Over the project period of 30 years with a potential extension, the forest owner is contractually responsible for overseeing the forest management company and to making sure that planned project activities are implemented.

- Please identify your key competitors.
    - Pina Earth considers all players in the carbon removal market to be worthy competitors. This specifically applies to companies innovating the carbon removal space and driving forward ambitious nature based solutions. While there is a number of players in Europe focusing on afforestation and reforestation, there is little competition with a focus on the needs of our regional forest ecosystems that need to be saved from risks posed and exacerbated by climate change.
- What sets your technology and/or business model apart from those of your competitors?
    - Current forest carbon project types are not suited for European ecosystems. While afforestation is an important lever to fight climate change, many European countries have high population densities and not many areas available for new afforestation projects. Further, as there is little illegal deforestation in Europe, this project type does also not have the potential it has in other regions like Latin America. Therefore, compared to other project types and competitors, our approach is unique in targeting the needs of regional forest ecosystems in Europe.

    - We offer a scalable, deep tech approach that brings down costs, sets financial incentives to adapt local forests to climate change, and takes transparency as well as auditability to a whole new level.

    - Furthermore, Pina Earth disrupts the VCM by decreasing the minimum size of climate projects, enabling specifically small landowners to participate in the VCM. Previously, high entry barriers allowed only large scale climate projects to be developed. Pina Earth decreases the minimum project size from 1,000 - 10,000 ha to only 150 ha. We plan to further reduce this minimum project size. This is accompanied by a certification process which is more than 10 times faster than a traditional certification.

Technical and Economic Feasibility

- Please provide a detailed explanation of the anticipated timeline and requirements for scaling the proposed CDR solution. You may include up to three supporting figures.
    - For the two climate projets we offer to Climate Vault, the volumes are issued available. This means that the project contract is signed, the PDD is developed and the validation by TÜV Nord is finalized. The offered volumes are ex-ante and will be sequestered over the project runtime.

        We succeeded in signing two 30-year contracts for projects totalling over 1,000 ha. As a result, we are perceived by forest owners as a trusted partner, and the traction we have gained helps us to develop new projects. On top of that, there are seven more projects (totalling 6,000ha) that are currently undergoing feasibility studies, which is the last stage of our sales funnel before signing a project contract. In addition, we are in the process of qualifying our 100,000 ha waitlist. To this end, we are currently in further discussions with forest owners of 73,000ha of forest area in earlier sales stages. In Germany alone, approximately 3 million hectares forest need adaptation.

        Our business model allows for scalability along four different vectors:

        (1) We enter into 30-year contracts with our customers and generate recurring revenues. Any new sales generate additional income, with low variable costs per unit.

        (2) We scale internationally. While our initial focus is on the German market, we plan to gradually offer our platform and services in more EU countries. We'll enter countries with similar tree and soil structures first (e.g. France) to leverage our technology without much need for regional adaptation.

        (3) We can cater to smaller and medium-sized customers (defined as <150 ha) by working with forest associations to bundle small projects and create self-service features to lower costs, further expanding our scalability potential.

        (4) Carbon credit prices are projected to grow significantly toward more than €100/ tCO2 (McKinsey, 2019), which further contributes to the scalability of our solution and the positive impact we have.

        To complement our scale up plans, we will develop 2 core additions from year 3 on:

(1) Training our models for further ecoregions, plant species and project types /// Certifying areas in different geographies requires highly transferable models using techniques such as self-supervised learning. But training data is expensive and computational costs can be high. Therefore, funding is needed to train our models and service further EU regions.

(2) Increased accuracy of our models /// Instead of estimating tree diameters using regressions, we plan to measure them directly with low-altitude flights. With clever filtering & segmentation points on the stem and circle fitting (e.g. RANSAC), the tree diameter can be measured directly. In our pilot project, we tested this technique and found satisfying results in the sub-canopy area. To be more independent from terrestrial data in the future without losses in accuracy, we plan to further invest in this topic.

To pursue our ambitious growth strategy to become market leader in Europe, we plan to raise a Series A funding round of €15mn at the beginning of 2024. The Climate Vault grant would allow us to hire more aggressively and thus speed up our technology development. In addition, partnering with Climate Vault will help us build our brand and build up our reputation when scaling internationally. If we hit all milestones, a Series B financing round, possibly in the range of >50mn €, could follow 18-24 months thereafter.

- What are the three most important risks your project faces?
    - Risk 1: There is a general project implementation risk stemming from the 30-year contract run-time. However, the risk of failure or reversal is limited, because forest owners and forest management companies have significant experience in implementing forest adaptation practices. Additionally, there is a very low rate of insolvencies among agricultural organizations in Germany (less than 0.1% [1]), which makes it highly unlikely that our project partners default. In our lighthouse projects, the overall risk is even lower than average because of Boscor's involvement as a professional forest management company.

    - Risk 2: There is a natural, environmental risk as is the case with all nature-based solutions: wildfires, storms, pests and diseases could deteriorate forests under contract. Pressure from climate change is increasing globally. If forests die off, even though they are adapted as part of our project scheme, we will lose biomass which was potentially already sold as a carbon credit. That is why Pina Earth provides a buffer pool to mitigate risks from droughts, fires, pest infestations etc. All of our projects are required to deposit around 20% of the carbon credits in a buffer pool for all projects. In our lighthouse project Luckaitz Valley, the specific risk buffer is 18.5 %.

- Risk 3: The regulatory risk affecting Pina stems from the high uncertainty of how the VCM may be regulated in the future. Regulation could lead to a completely regulated (compliance) European or domestic carbon market including forest carbon (comparable to the model of California, USA). Detailed legislation with regard to establishing and regulating domestic (voluntary) carbon markets or policies for offsetting are still in their infancy and Pina Earth considers the regulatory risk feasible.

    - [1] Destatis (2022). Insolvenzverfahren (Unternehmen) - https://www-genesis.destatis.de/genesis//online?operation=table&code=52411-0001&bypass=true&levelindex=0&levelid=1658818124341#abreadcrumb
- What permits or other forms of regulatory permission do you require, if any? Please clearly differentiate between those you have already obtained, those you are currently in the process of obtaining, and those that will need to be obtained in the future (i.e. you have not started the process to obtain).
    - Currently, EU carbon projects on the VCM are not subject to regulatory approvals. However, stakeholders have set expectations for carbon credit projects. At Pina, we strive for the highest standards available. Therefore, we have aligned our projects with 14064-2 and validated by TÜV. Now, we are getting our method of forest adaptation approved by the Ecosystem Value Association, which is in the process of creating a new carbon standard tailored to the needs of European forests. In the long run, we want to get our methodology approved by the Verra in order to support our growth ambitions in Europe.

Timeline and Permanence

- How long will the project be in operation for the purpose of Climate Vault award?
    - 30 years
- What is the projected schedule and quantity of carbon removals?
    - [April/2023]: 42,000 tCO2
      [December/2023]: 50,000 tCO2
      [December/2024]: 135,000 tCO2
      [December/2025]: 200,000 tCO2
      [December/2026]: 300,000 tCO2
      [December/2027]: 450,000 tCO2
      Total: # tCO2: 1,177,000 tCO2
- For the schedule outlined in the previous answer, please detail how you anticipate your carbon removal capacity will be distributed.
    - The indicative volumes above are additionally issued ex-ante volumes in each time period.
      The volumes will turn ex-post throughout the 30 year project runtime.
- Provide a description and graphical depiction of the disposition pathway for the captured carbon, with supporting justification for how the carbon will be isolated from the environment. Include any estimates of the range of uncertainties in the assessment.

For example: The supporting justification could be based on an approved underground injection control permit, or research studies that have shown permanence of the proposed form of disposition.

- *The rate of carbon sequestration and storage can vary depending on factors such as forest age, species composition, climate, and management practices. We take these factors into account when simulating the carbon storage potential 30 years into the future. The attached presentation shows a sample pathway for the removed carbon and this pathway is tailored to each individual of our climate projects.*

- *In our flagship project Luckaitz Valley, the sampling error is 7.83% according to the forest inventory), which is significantly below the 10% generally considered as a quality criterion (UNFCCC, 2015). The largest inaccuracies arise when extrapolating the number of trees in the permanent sample inventory to the entire stand, since at a usual sampling density of one each plot (13m radius) per 2-ha area, only about 1% of the trees are surveyed. Terrestrial height measurements of trees have further shortcomings, as these are estimated based on elevation curves and common terrestrial measurement methods are less accurate than height measurements by LiDAR (Ganz & Käber, 2019). To address this, the number of trees on the plot and individual tree heights were corrected using remote sensing data.*

- What are the upper and lower bounds of the permanence claimed in the previous question?
    - 100 - 100
- How will you quantify the actual permanence of the carbon sequestered by your project?

    Note: 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.)?

    - The permanence is 100 years, as a) the risk buffer includes the project duration to cover beyond contract length, following the guidelines of Verra's Verified Carbon Standard (VCS), b) the rotation ages of the new species on the ground are much higher (80-150 years) than the 30 year project duration (so there is no incentive to harvest them after the project ends) c) the current forestry laws in Germany prevent clear cutting or similar activities and force you to reforest within a period of 10 years. In the first 30 years, monitoring takes place after years 3, 6, 10, 15, 20, 25 and 30. Afterwards estimations rely on scientific research.

- What permanence risk does your project face?

    For example: 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 uncertainties exist about the underlying technological or biological process?

- Socioeconomic risks originate from our contract partners. Specifically, this would be the case if forest owners do not implement contractually agreed forest adaptation measures. As forest owners are legally obliged to implement the defined measures, we can account for this risk by penalties for contract breaches.

  Physical risks originate from climate change itself as wildfires, storms, and diseases become more and more severe. Our projects have increasing climate-resiliency of forests as a core goal. Forest adaptation transforms monocultures, which are heavily affected by bark beetles, droughts, and storms, to more climate-resilient mixed forests. Mixed forests not only store additional carbon, but are also more resilient to diseases, storms and droughts because different tree species have diverse characteristics. Furthermore, nature rejuvenation increases the overall stability and self-replication abilities of the forest. In this way, our project activities directly reduce the physical project risks stemming from climate change.

  Furthermore, Pina Earth provides a buffer pool to mitigate risks from droughts, fires, pest infestations etc. All of our projects are required to deposit around 20% of the carbon credits in a buffer pool for all projects. In our lighthouse project Luckaitz Valley, the specific risk buffer is 18.5 %.

- What mechanisms do you have in place to monitor, identify and report any potential reversal of sequestered carbon from your project? Please describe and provide any supporting evidence, as applicable.
    - The monitoring takes place after year 3, 6, 10, 15, 20, 25 and 30. Based on new data gathered during the project period, an updated version of our digital twin is created and our calculations are re-evaluated. In the unlikely event that the amount of sequestered carbon in a particular project would differ more than 20% from our projections, and, hence, exceed our risk buffer, we compensate for the credits from our total risk buffer volume shared among all projects. Once the monitoring and risk assessment report are complete, the buyer will be informed about the outcomes of the evaluation.
- What safeguards or assurances do you have in place, if any, that can help to extend the lifetime of the sequestered carbon, beyond the claimed permanence period? Please describe and provide any supporting evidence, as applicable.
    - Our forest adaptation projects aim to increase forests' climate-resiliency towards a long-term carbon storage equilibrium. By transforming our forests to mixed and rejuvenated permanent forests that are stable against droughts, storms and pests, we build permanent carbon reservoirs. Once a forest owner succeeded to establish a mixed permanent forest, it is considered highly unlikely that they will

revert this forest to a monoculture and thus reducing the lifetime of the sequestered carbon.

- Additionally, German law prohibits clear cuts and incentivizes sustainable forest management practices, which means that harvested trees are replanted. Lastly, Pina Earth applies a conservative carbon calculation methodology and a generous risk buffer, which provide an additional safety margins against unforeseen losses in the future and strengthens the lifetime of the sequestered carbon beyond the claimed permanence period.

Project Scale and Net Capacity

- Total gross carbon removal (in metric tons of CO2, or tCO2)
    - 85,031
- Total project emissions (in metric tons of CO2, or tCO2)

    Note: This figure should correspond to the boundary conditions described below in 5.1.4 and 5.1.5.
    - 22,611

- Provide a carbon balance or "process flow" diagram for your carbon removal solution, visualizing the numbers in 5.1.0 - 5.1.3.

    Note: Please include all carbon flows and sources of energy, feedstocks, and emissions, with numbers wherever possible. If a third-party LCA has been performed, please provide a link to it as well.
    - *While a process flow is less relevant for our project type of Ecosystem restoration, we detailed the carbon sinks and sources of our projects in the PDD sections 4.1 and 4.2. In addition, please refer to slide 10 of our attached presentation to learn about the indicative carbon sequestration in our projects.*

- *Justify the boundary conditions you assumed in the previous question. Why do your calculations and diagram include or exclude different components of your system?*
    - *Please see the boundary conditions our projects in the PDD sections 4.1 and 4.2*
- *Justify the numbers used in your diagram in from this section. Are they estimated by models or have they been measured directly? Have they been independently measured? Your answers can include references to peer-reviewed publications.*
    - *We use forest owners' terrestrial inventory data which is independently measured and the same data used for the German federal tax office and if required, fuse it with aerial remote sensing data (multispectral camera images with infrared data and LiDAR scans) from public authorities. In this way, we achieve 100% area coverage to detect and measure tree heights, crown area, etc.*

After starting the project, the project areas are monitored frequently using a combination of additional terrestrial and/or aerial data. This data is used to update the digital twin of the forest and to compare the calculated with the actual carbon removal amount. For details on the monitoring, please see slide 22 of our attached presentation.

For our approach, we use the latest technologies and scientific approaches from the field of climate modeling. The groundbreaking character of the research in this field was recognized with the 2021 Nobel Prize in Physics for Syukuro Manabe's modeling of Earth's climate and global warming. We developed a brand-new, AI-based simulation that allows us to predict forest growth and carbon stocks under climate change impacts for more than 30 years into the future. This simulation takes into account varying combinations of tree species and provides detailed recommendations for forest owners to adapt their forests in the most climate-resilient way. To make use of these adaptations in the most profitable way, our service enables small forest owners to get access to the voluntary carbon market, a process which was formerly too costly, complex, and time-consuming.

Cost and Funding

- What is the "all-in" cost per metric ton of CO_2 today?

  Note: Climate Vault considers qualified projects at any cost per metric ton of CO_2. An applicant will not be disqualified based on cost per metric ton of CO_2.
  - *Under the assumption of payment in 2023:*

    64.13 $/tCO2 for > 5,000 t
    58.36 $/tCO2 for > 10,000 t
    50.02 $/tCO2 for > 50,000 t
    44.89 $/tCO2 for > 100,000 t
    40.40 $/tCO2 for > 200,000 t
- *Please provide a cost summary for the project that outlines:*
- *1) Capital expenditures (include useful life)*
- *2) Major operating costs*
- *3) The net cost per metric ton of CO_2 (tCO2)*
  The total costs of forest adaptation from monocultures into mixed, climate-resilient forests are in the range of 7-10 k€ per hectare [1]

  [1] https://www.zdf.de/nachrichten/panorama/wald-klimawandel-waldbraende-brandenburg-100.html

- *How is the project currently being funded?*

- *Until now, climate-resilient forest adaptation has not been incentivized: there is no law in place that prevents monoculture forests, there is a distressing lack of public funding, and no other support mechanism for forest owners. The cost of implementing the project on the area during the crediting period exceeds the income generated by the project implementation.*
- *Are additional funding sources being sought for the proposed solution?*
    - *No. N/A. Both projects did not apply for state support programs. In general, the implementation of Pina Earth's projects is possible both with and without state support, as long as the costs of implementing the project are not covered by any program alone.*
- *Does your proposed solution currently have volume available?*
    - *42,000 tCO2*

Additionality

- How and to what extent would a grant award from Climate Vault enable your proposed solution to remove more carbon dioxide from the atmosphere than would have otherwise been possible without the grant award? Please quantify your claims of additionality and provide a profile outlining the metric tons of carbon dioxide removed per grant dollar received.
    - The Climate Vault grant would allow us to remove the carbon emissions you invest into. By re-investing the income, we could hire more and more qualified experts and thus speed up our technology development. In addition, partnering with Climate Vault will help us strengthen our brand and build up our reputation when scaling internationally. Compared to partnerships with corporate offsetters, we expect that Climate Vault's focus on research and developmend in the field of innovative technologies will help us to further develop our carbon removal technology and connect with like-minded tech-focused experts. We hope to also gain access to Climate Vault's technological and strategic expertise to scale or technology fast and enable the adaptation of large areas of forest in Germany, Europe, and worldwide.
- How and to what extent does your proposed solution enable additional carbon removal or mitigation to occur (e.g., by displacing more carbon-intensive products)? Please demonstrate and quantify your claims.
    - Our solution enables additional carbon removal and mitigation in multiple ways:

      First, we provide legal additionality as our climate projects and planned measures are not prescribed by laws, ordinances, or regulations (see e.g. the laws on forest and nature protection by the federal government of Germany: Bundesnaturschutzgesetz 2009, Bundeswaldgesetzt 1975).

      Second, we enable financial additionaly as the cost of implementing the project measure on the area during the crediting period exceeds the income generated by the project implementation.

Third, our climate projects generate an additional, real and measurable climate impact, which is above the performance level of standard practice (baseline scenario or "business as usual").

Lastly, our projects aim to make forests climate-resilient against the challenges exacerbating with climate change: storms, droughts and pests. This is why our projects also enable additional carbon mitigation besides carbon removal: by preventing forest loss caused by climate change.

Leakage

- Please describe and quantify the impact of your proposed solution on the overall carbon dioxide emissions of your sector/industry. What are the realizable carbon benefits?
    - Our solution has no leakage effects, as there is no reduced wood extraction and therefore no impact on the timber market.

        In more details: Changes in carbon emissions and withdrawn volumes due to carbon emission sources and sinks resulting from
        activity shifts (internal) or market adaptation (external) were considered. In this climate project, the withdrawal volume in the carbon emission baseline is insignificantly different from the withdrawal volume in the climate project scenario. As a result, the risk of internal and external displacement is negligible.

Public Engagement and Environmental Equity

- Who are the external stakeholders that would have an interest in the proposed project?
    - External stakeholders interested in our projects are: third-party certification authorities, distribution partners, policy makers, and citizens.
- How have you engaged with these stakeholders? Or if you have not yet engaged with them, how do you propose to engage with them? How will they likely view the proposed project? What is the likelihood of negative comments or attempts to stop the proposed project?
    - Certification authorities: To ensure integrity and independence, we partner with auditors and NGOs. Our current audit partner is TÜV Nord Cert GmbH, an accredited Verra VVB. For guaranteeing highest quality standards and conformity with regulations, our projects are certified in line with the ISO 14064-2. At the moment, we collaborate with the NGO Ecosystem Value Association e.V. to conduct a "public consultation" of our forest carbon methodology under the "Wald-Klimastandard". "Wald-Klimastandard" is the first German standard to certify forest ecosystem services, founded by ex-Gold Standard and Fairtrade executives. Within the public consultation, stakeholders from all areas (forestry

science, carbon markets, climate science, carbon buyers, policy, etc.) discuss, comment, and approve the methodology. This step adds significant trust to Pina Earth's brand. We will be the first German player with an approved methodology for forest adaptation, which allows for a strong market positioning.

Distribution partner: Until now, we are engaged in partnerships with different distribution partners (forest management companies, carbon marketplaces, sustainability consultancies, brokers) that allow us to scale sales and focus on expanding our project areas.

Policy makers: The VCM is unregulated, but initiatives at the EU level, PPP, and NGOs are working on rules for the VCM. Policy makers are incentivized, as the VCM helps finance the transformation towards a green economy. We're collaborating with policy makers in the process of accrediting our methodology under the "Wald-Klimastandard" during the public consultation and beyond. Further, we're in contact with policy makers at the local level (e.g. The German Green Party) and the EU level, to influence policy making as much as possible.

Citizens: Forests provide essential services but are already affected by climate change. Therefore, investment into forest adaptation benefits society at large. This knowledge has arrived in the public, which can be seen in Fridays for Futures demonstrations and increasing vote shares for Green Parties across Europe.

- Are there site-specific environmental equity concerns regarding the proposed project?
    - No, our solutions is specifically targeted to the needs of underrepresented forest owner group. By offering small- and medium-sized forest owners access to the VCM, we improve market efficiency, inclusivity and removal outcomes. Our technological innovation is necessary because of the ownership structure of forests. Approximately 50% of German forests are privately owned by many small- and medium-sized forest owners. Of these private landowners, another 50% own less than 20 hectares of forest. And this is not only true for Germany. The average private EU forest area is approximately 13 hectares. We, therefore, have fragmented ownership that sums up to a very large area of forest. If we want to make EU forests climate resilient, smaller landowners need to be part of the equation.
    Our technology is designed to democratize access to carbon markets, empowering forest owners of all sizes. We believe that protecting the environment and supporting local communities go hand in hand.

    Firstly, by creating job opportunities in rural areas, we help combat the negative effects of accelerated urbanization, which has caused the loss of qualified labor in many regions over the past decade.

Secondly, forests provide far more than just timber - they enhance biodiversity, purify air and water, and protect against natural disasters. By safeguarding these ecosystems, we not only contribute to a healthier and more resilient planet but also create recreational opportunities for everyone.

Grant Request

- What is the net carbon removal of your proposed project? Please provide both an annual schedule and a total over the proposed length of the Climate Vault award.
    - [Year 1]: 92,000 tCO2
      [Year 2]: 135,000 tCO2
      [Year 3]: 200,000 tCO2
      [Year 4]: 300,000 tCO2
      [Year 5]: 450,000 tCO2
      Total: # tCO2: 1,177,000 tCO2

      Note: these are bundled volumes, as the scalability of our approach allows us to offer volumes from multiple projects under a Program of Activities

- Please propose a schedule for award of allowances consistent with the projected performance of the proposed project over the life of the award. If you are requesting an accelerated award of allowances (i.e., receiving allowances in amounts that exceed the rate of carbon removal), please provide a justification for the advance.

    Note: Payment is provided as emission allowances (in metric tons). Grantee is free to monetize the allowances immediately or hold them for some period of time.
    - We request an accelerated award of allowances. This is necessary to finance the forest adaptation measures ex-ante so that forests can be adapted against climate change - before they suffer from climate change challenges such as storms, droughts and pests.

- Other than purchasing (providing a grant), what could we do to help your project?
    - Partnering with Climate Vault will help us strengthen our brand and build up our reputation when scaling internationally. Compared to partnerships with corporate offsetters, we expect that Climate Vault's focus on research and developmend in the field of innovative technologies will help us to further develop our carbon removal technology and connect with like-minded tech-focused experts. We hope to also gain access to Climate Vault's technological and strategic expertise to scale or technology fast and enable the adaptation of large areas of forest in Germany, Europe, and worldwide. Further, Climate Vault would help us by providing introductions to companies being interested in purchasing EU carbon removals.