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# Executive Summary

VIRIDIS is a European company active in the green technology sector. To survive and grow, the company must attract significantly more investment in sustainable projects. The current governance model is hierarchical and centralised, which creates barriers in transparency, inclusivity, and stakeholder engagement. These barriers limit trust from investors, restrict employee and partner participation, and weaken VIRIDIS’s ability to capture opportunities in the fast-growing sustainable finance market (European Commission, 2019).

This thesis investigates whether a decentralised governance system can provide a better alternative to the traditional model. It is guided by three central research questions. First, is a decentralised governance system more effective than a traditional one in increasing investment and participation rates? Second, does inclusion in decision-making stimulate active stakeholder engagement in other VIRIDIS projects, thereby strengthening the network effect? Third, does a decentralised governance model specifically direct more capital into green technology rather than general technology?

The research is conducted as a **single-case study of** VIRIDIS, with its governance transition as the primary unit of analysis. **Sector-wide transformations and macroeconomic frameworks**—including the European Green Deal, the EU Taxonomy, and global sustainable finance initiatives—are addressed **only as contextual background** to situate VIRIDIS s challenges and opportunities. This ensures the study remains focused on VIRIDIS while acknowledging the broader policy and market landscape in which the company operates.

The study draws on theory from blockchain governance, decentralised finance, and sustainable finance, combined with practical research methods such as stakeholder analysis, ideation sessions, iteration rounds, and prototype testing. Findings suggest that a tailored DAO model can address the key governance gaps of VIRIDIS. Decentralised decision-making improves transparency, builds trust, and creates incentives for wider participation, while aligning the company with European frameworks such as the Green Deal, EU Taxonomy, and ESG disclosure rules (European Commission, 2019; Kellers, 2022).

The proposed governance operating model outlines how VIRIDIS can implement DAO principles through token-based voting, transparent dashboards, and phased adoption. The business case demonstrates that this model is financially viable, generating new revenue streams through V-GTI and V-ECO initiatives while achieving cost savings and efficiency gains. Scenario analysis shows resilience in best, normal, and worst-case conditions (von Wachter, 2023).

The conclusion of the thesis is that decentralisation offers VIRIDIS a viable and competitive governance model that both secures long-term survival and strengthens its position as a leader in sustainable innovation. By adopting this model, VIRIDIS can attract more investors, increase stakeholder participation, and channel more capital into green technology projects that contribute to European and global sustainability goals (Kellers, 2022; von Wachter, 2023)

# 1. Context and Problem Definition

## 1.1 Company Overview: VIRIDIS

Viridis is a Green Tech Investment AG is a European company active in the green technology sector, with the mission of accelerating the transition toward a sustainable and climate-neutral economy. Positioned at the intersection of innovation, sustainability, and finance, Viridis develops projects focused on clean energy, circular bioeconomy solutions, and environmentally responsible technologies. Its long-term vision explicitly aligns with the European Green Deal, the Paris Agreement, and the UN Sustainable Development Goals (European Commission, 2019; VIRIDIS, 2025b).

Viridis operates as a **digital cooperative ecosystem**, leveraging decentralised governance through its **VIA Security Token**. This token, issued on the Polygon blockchain, grants investors both financial participation and governance rights via a DAO model. VIA enables token holders to share directly in portfolio profits, while ensuring transparency and efficiency through smart contract–based distribution mechanisms. Importantly, it embeds community participation by granting voting rights on strategic decisions, positioning Viridis as an innovator in sustainable finance (VIRIDIS, 2025a).

Despite these innovations, the company faces **capital mobilisation challenges**. Access to institutional and private funding remains limited, restricting its ability to scale and compete against both traditional technology firms and sustainability-driven ventures. The 2025 financial strategy identifies the need for €8 million in growth capital across three phases (“Build, Fuel, Fly”), aimed at funding green start-ups, developing Web3-based digital infrastructure, and transitioning to a fully decentralised cooperative model (VIRIDIS, 2025a). Without this, VIRIDIS risks losing ground in the rapidly expanding sustainable finance market, which demands transparency, accountability, and measurable impact (Kellers, 2022).

Stakeholder interviews conducted during GP2 revealed that the current centralised governance model creates barriers to inclusivity and efficiency. Employees and external partners pointed to slow decision-making processes and a lack of participatory mechanisms, which reduce trust and hinder collaboration (Interviews GP2, 2025). These findings mirror broader research on firm governance, which shows that decentralised structures foster transparency, innovation, and stakeholder engagement, especially in dynamic markets (Aghion & Tirole, 1997).

To address these challenges, Viridis aims to adopt a DAO-enabled governance system that enhances stakeholder participation, increases investor trust, and ensures long-term resilience. This shift is not only a financial innovation but also a strategic necessity to position Viridis as a leader in sustainable innovation. By integrating decentralised governance with EU sustainable finance frameworks, Viridis seeks to mobilise more capital into green technologies and deliver measurable impact (European Commission, 2019; von Wachter, 2023; VIRIDIS, 2025a).

## 

## 1.2. Stakeholder Mapping

A visual stakeholder map (Visual1 below) provides a comprehensive overview of the VIRIDIS ecosystem, showing the relationships between GTI, VECO, their respective boards, shareholders, and external stakeholders. The report highlights the overlaps between the board members of GTI and VECO and identifies key external stakeholders such as the 31 First Founders and governmental and regulatory bodies. The map categorizes stakeholders according to their roles and engagement strategies.

More infos can be found in the Appendix section A.1.

### 1.2.1. Detailed Classification of Stakeholder Engagement

VIRIDIS employs tailored engagement strategies to address the diverse needs and expectations of its stakeholders.

 The following visual provides a detailed breakdown of VIRIDIS's internal and external stakeholders, their roles, interests, and how they are engaged in the organization's governance and development:

**Blue nodes** = Internal stakeholders

**Green nodes** = External stakeholders

Each node shows: **Role**, **Interests**, and **Engagement**.

A screenshot of a computer screen

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Figure 1Stakeholder Map S.Geissler (2025)

## 1.3. Problem Statement: Governance and Investment Gap

VIRIDIS faces a dual challenge that directly threatens its survival and long-term growth: insufficient investment in its green technology projects and an outdated governance structure that limits its ability to attract and sustain such investment. While the demand for sustainable finance and green innovation is expanding rapidly across Europe, Viridis struggles to capture a significant share of this capital flow. The core issue lies in the disconnect between investor expectations for transparent, inclusive governance and the company’s current centralised decision-making model.

A diagram of a company operating model

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Figure 2 Classical Governance Operating Model (Howell, J. 2024, July 2)

The present governance operating system is hierarchical and based on the Governance Operating Model after Howell, J. , with decision-making power concentrated at the top. This structure creates several problems:

* Limited Transparency: Investors and stakeholders lack visibility into how strategic decisions are made and how resources are allocated.
* Low Stakeholder Participation: Employees, partners, and external collaborators have minimal influence in shaping company direction, which diminishes engagement and trust.
* Reduced Investor Confidence: In an environment where sustainable finance frameworks emphasise accountability and traceability, a traditional governance model signals rigidity and outdated practices.
* Missed Opportunities for Growth: Without inclusive governance mechanisms, VI fails to activate the network effect that could mobilise wider participation and attract additional capital into its projects.

This governance and investment gap places VIRIDIS at a strategic disadvantage. Competing companies that adopt more innovative, decentralised governance structures are better able to attract private capital, build stronger communities of stakeholders, and position themselves as leaders in the sustainable finance ecosystem. Unless VIRIDIS addresses this gap, it risks losing relevance in a sector where both technological innovation and governance Innovation are increasingly decisive factors for success.   
More information can be found in the appendix section A.2 Governance Inefficiencies at VIRIDIS.

The problem, therefore, is not only financial but systemic: VIRIDIS must transition from a centralised governance structure to a decentralised, participatory model to restore investor confidence, unlock stakeholder engagement, and secure the capital needed to sustain and expand its green technology mission.

## 1.4. Opportunity in Sustainable Finance

The financial landscape in Europe is undergoing a profound transformation, driven by the European Green Deal, the Paris Agreement, and the United Nations Sustainable Development Goals (SDGs). At the center of this shift is sustainable finance, which integrates environmental, social, and governance (ESG) considerations into financial decision-making. This transition is not only a regulatory obligation but also a significant opportunity for companies such as VIRIDIS, which are positioned at the intersection of green technology and sustainable investment (European Commission, 2019; VIRIDIS, 2025a).

The European Union has made strong commitments to mobilise private and public capital for sustainable growth. According to the European Commission, between €175 and €290 billion in additional yearly investment will be required over the coming decades to achieve climate neutrality by 2050 (European Commission, 2019). This funding gap represents a substantial pool of capital searching for credible, transparent, and impactful opportunities. For companies, the benefits include access to new sources of finance, incentives for innovation, and stronger alignment with investor preferences for climate-conscious strategies (Kellers, 2022).

At the same time, investor expectations are shifting. Financial market participants are now bound by enhanced disclosure requirements, ESG reporting obligations, and the EU Taxonomy Regulation, which together reshape how investment decisions are made (European Commission, 2019). Investors increasingly demand that capital flows into projects that are verifiable, traceable, and transparent. Companies that fail to demonstrate robust governance and accountability risk being excluded from sustainable investment portfolios in favour of competitors that meet these new standards (von Wachter, 2023).

For VIRIDIS, this evolving environment creates a unique strategic opening. The company has already identified decentralised governance and tokenisation via the VIA Security Token as mechanisms to strengthen transparency, align with investor expectations, and build trust within its stakeholder ecosystem (VIRIDIS, 2025a). By adopting a DAO-enabled governance structure that emphasises inclusivity, transparency, and accountability, Viridis can differentiate itself in the sustainable finance market and position itself as an attractive destination for both institutional and private investors.

Seizing this opportunity would allow VIRIDIS to bridge its current investment gap, secure long-term growth, and actively contribute to Europe’s transition toward a climate-neutral economy. Sustainable finance is therefore not merely a financial requirement for Viridis but a strategic lever that can transform its governance model, reinforce its network effects, and solidify its role as a pioneer in sustainable innovation (VIRIDIS, 2025a; Kellers, 2022).

## 1.5. Research Questions and Objectives

To address the governance and investment challenges faced by VIRIDIS, this thesis is guided by three central research questions:

1. Is a decentralised governance system more effective than a traditional governance system when measured by increased investment within the company or by participation rates?
2. Does more inclusion in decision-making increase active stakeholder participation in other Viridis projects, thereby strengthening the network effect?
3. Does the adoption of a decentralised governance system specifically stimulate investment in green technology, as opposed to more generic technology sectors?

These research questions are designed to evaluate both the financial and organisational implications of transitioning from a hierarchical to a decentralised governance structure. They connect directly to the company’s strategic need to secure more sustainable investment and to engage stakeholders more effectively in its mission.

Based on these questions, the objectives of this thesis are as follows:

* To analyse the limitations of the current governance system at Viridis and identify the gaps that hinder transparency, participation, and investment.
* To explore decentralised governance models, particularly DAO-based frameworks, and assess their potential to address these gaps.
* To evaluate stakeholder engagement and participation through mapping, workshops, and feedback, to understand how inclusivity can drive network effects across Viridis projects.
* To develop and test prototypes that demonstrate how decentralised tools (e.g., dashboards, token-based voting) can operate within VIRIDIS.
* To construct a multi-value business case that shows the financial viability, sustainability alignment, and competitive advantage of adopting a decentralised governance model.
* To provide an implementation roadmap that enables Viridis to transition toward decentralised governance in a phased and sustainable way, aligned with EU sustainable finance frameworks.

By addressing these objectives, the thesis aims to generate both theoretical and practical insights into how Viridis can strengthen its governance structure, attract greater levels of green technology investment, and position itself as a frontrunner in sustainable innovation.

# 2. Context Analysis

## 2.1. External Environment: EU Sustainable Finance and Green Deal

The external environment in which VIRIDIS operates is strongly shaped by the European Union’s sustainable finance agenda and the broader policy framework of the European Green Deal. Together, these initiatives create both regulatory pressure and market opportunity for companies active in green technology.

The European Green Deal sets the overarching objective of making Europe the first climate-neutral continent by 2050. To achieve this, the EU has committed to three key targets by 2030: a minimum 40 per cent reduction in greenhouse gas emissions compared to 1990 levels, at least 32.5 per cent improvement in energy efficiency, and at least 32 per cent of final energy consumption coming from renewable sources (European Commission, 2020). These goals signal to businesses and investors that the transition toward low-carbon, resource-efficient, and circular systems is no longer optional but a structural requirement for participation in the European economy.

The EU Sustainable Finance Strategy complements the Green Deal by directly targeting the flow of capital. The Commission estimates that between €175 and €290 billion in additional yearly investment is required to finance the transition to climate neutrality (European Commission, 2020). To mobilise this capital, the EU has introduced key regulatory instruments, including:

* EU Taxonomy: A unified classification system that defines which economic activities can be considered environmentally sustainable.
* Sustainability-related disclosures: Financial market participants and advisors must disclose the environmental impact of their investment decisions, increasing transparency and accountability.
* Climate benchmarks and ESG disclosures: Investors now have access to climate-conscious benchmarks, aligning portfolios with the Paris Agreement.
* Green bond standards and ecolabels: Efforts are underway to create trusted frameworks for labelling financial products, increasing investor confidence in sustainable assets.

For businesses like VIRIDIS, this policy environment creates a double incentive. On the one hand, companies that cannot demonstrate alignment with sustainability goals risk reduced access to capital, loss of investor trust, and eventual regulatory penalties. On the other hand, those that can provide transparency, measurable sustainability outcomes, and innovative governance structures gain privileged access to a rapidly expanding pool of sustainable finance.

In this context, VIRIDIS’s strategic challenge of attracting investment is not only a financial concern but also a governance challenge. Investors are no longer satisfied with traditional corporate reporting; they increasingly demand traceability, inclusivity, and accountability in governance processes. By embracing decentralised governance aligned with EU sustainable finance principles, VIRIDIS can position itself as a trustworthy and innovative actor in the European Green Deal landscape, making it a more attractive destination for both private and institutional investment.

## 2.2 Industry Trends in Governance Models

The governance landscape across digital and market-facing organizations is moving along three concurrent trajectories that matter for VIRIDIS: consolidation of centralized control in regulated contexts, hybrid models that blend central assurance with distributed execution, and fully decentralized governance with on-chain participation.

1) Centralized governance with a trusted third party remains prevalent in regulated markets.  
 Sectors that require strong guarantees for privacy, compliance, and settlement still concentrate authority in a governor organization that provides identity and access management, auditability, and trade execution guarantees. This model scales operationally yet can limit rapid expansion and cross-organizational automation because process interoperability depends on one operator’s rules (Tkachuk, 2023).

2) Hybrid and permissioned models are growing as a transitional form.  
Enterprise and sector marketplaces are adopting permissioned blockchains to distribute execution while retaining assurance functions. In these settings, the regulator or a designated authority often becomes the de facto trusted third party that certifies identities, sets endorsement policies, and arbitrates disputes. Hybrids improve scalability and privacy through mechanisms like private data collections or privacy groups but can reduce universal auditability of transactions and introduce coordination overhead between organizations (Tkachuk, 2023).

3) Decentralized governance via DAOs and tokenized participation is maturing in open ecosystems.  
Public-blockchain environments have advanced modular components for governance: on-chain voting, treasuries, and composable interfaces that let stakeholders integrate services and move assets across applications. This composability strengthens network effects and can accelerate innovation and participation. At the same time, open systems operate in adversarial conditions, which raises risks of manipulation, collusion, and incentive misalignment if governance design and monitoring are weak (von Wachter, 2023).

### 2.2.1. Cross-cutting technical and institutional trends

Identity and assurance: Strong identity, membership services, and certificate authorities are foundational in both centralized and permissioned settings to control access and enforce policies; decentralized identifiers and selective disclosure are emerging but must be balanced with compliance requirements (Tkachuk, 2023).

Privacy versus auditability: Privacy-preserving execution improves data protection and commercial confidentiality but can constrain full-chain audit trails. Design choices must match sector obligations for verifiability and oversight (Tkachuk, 2023).

Consensus and performance: Crash or Byzantine fault tolerant protocols in permissioned networks deliver low latency and high throughput for governance operations with lower energy usage than public proof-of-work systems, supporting enterprise-grade decision and settlement workflows (Tkachuk, 2023).

Composability and integration: In open DeFi-style environments, composability enables rapid integration of governance modules but increases systemic coupling, making risk propagation and strategic behavior more likely without robust guardrails and monitoring (von Wachter, 2023).

Collusion and capture risks: Even in decentralized settings, concentration of authority among validators, regulators, or large token holders can reintroduce centralization pressures; governance must include anti-capture mechanisms and transparent accountability (Tkachuk, 2023; von Wachter, 2023).

Implication for Viridis  
For an investment-seeking firm in a regulated EU context, the industry direction points to a staged path: adopt a hybrid governance model that secures identity, privacy, and compliance while piloting DAO-style participation for transparency and inclusion. Over time, integrate composable modules where they strengthen network effects and investor confidence, and retain assurance functions where regulation demands it.

## 2.3. Benchmarking Traditional vs Decentralized Governance

Comparative lens and criteria

To evaluate VIRIDIS’s governance options, we benchmark traditional hierarchical governance against decentralized governance with DAO-style participation across core criteria that determine investor confidence, stakeholder engagement, regulatory fit, and operational performance.

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Figure 3 Traditional Hirearchy modle versus DAO Governance modle S.Geissler (2025)

These visual contrasts traditional hierarchical governance with decentralized DAO governance. The Table below will show more details.

In the hierarchical model (left), authority flows downward from the CEO and Board to middle management and finally to employees. Decision-making is centralized, creating efficiency in command but limiting transparency and stakeholder participation.

In the DAO governance model (right), authority is distributed among token holders who are interconnected in a network. Decision-making is collective, transparent, and based on token-based voting. This enhances inclusivity, accountability, and trust, while reducing dependency on a central authority.

|  |  |  |
| --- | --- | --- |
| **Criterion** | **Traditional hierarchical governance** | **Decentralized governance with DAO-style participation** |
| **Decision rights and control** | **Centralized board and executive control. Clear accountability, low inclusivity.** | **Distributed decision rights via token or membership voting. Higher inclusivity, requires careful role design to avoid diffusion of responsibility.** |
| **Identity, access, and assurance** | **Central identity and access management with a trusted operator. Strong access control and contractual guarantees.** | **On-chain or hybrid identity with membership services and attestations. Regulator or designated authority often acts as de facto trust anchor in permissioned settings.** |
| **Transparency and auditability** | **Internal audit trails, selective disclosure to investors and regulators. Lower external transparency.** | **Default on-chain logging and verifiability of proposals, votes, and fund flows. Privacy-preserving modules can reduce universal auditability and require compensating controls.** |
| **Privacy and confidentiality** | **Strong data minimization by central operator. Trade secret protection is straightforward.** | **Privacy groups, private data collections, or selective disclosure mitigate leakage, yet may constrain end-to-end public audit. Governance must balance privacy with verifiability.** |
| **Performance and scalability** | **High throughput for decisions within the firm. Execution latency is low.** | **Permissioned consensus offers enterprise-grade throughput and low energy use. Public networks add latency and adversarial risk; careful protocol choice is required.** |
| **Incentive alignment** | **Relies on contracts, KPIs, and compensation schemes. Participation incentives are indirect.** | **Native incentive mechanisms through tokens, reputation, and programmatic treasuries. Risk of token concentration and voting apathy must be mitigated.** |
| **Capture and collusion risk** | **Risk of managerial or owner entrenchment.** | **Risk of large-holder dominance, validator collusion, or regulator capture in hybrids; anti-capture design and monitoring are essential.** |
| **Governance agility** | **Fast for small groups, bottlenecks at scale.** | **Programmable processes enable rapid iteration. Poorly designed voting or quorum rules can slow decisions.** |
| **Compliance and oversight** | **Well understood by regulators and investors.** | **Strong alignment possible in permissioned designs with explicit endorsement policies and regulator nodes. Requires governance-by-design documentation for audit.** |
| **Composability and network effects** | **Limited cross-organizational interoperability.** | **High composability of modules and interfaces can amplify participation and ecosystem value; also propagates systemic risk without guardrails.** |
| **Cost structure** | **Lower tooling cost, higher coordination cost across partners.** | **Higher initial design and tooling cost, lower marginal cost for multi-party coordination once established.** |
| **Investment signal to ESG capital** | **Depends on disclosures and reputation.** | **Verifiable transparency, inclusive participation, and programmable accountability can signal superior ESG governance if designed to regulatory standards.** |

Table 1. Benchmark of governance models S.Geissler, 2025)

### 2.3.1.Design implications for VIRIDIS

A hybrid pathway is recommended based on the research: VIRIDIS should use permissioned, regulator-anchored components for identity, assurance, and sensitive data while introducing DAO-style participation for proposals, budget allocations, and project selection. This aligns with EU disclosure expectations and preserves auditability where needed.

Embed anti-capture safeguards: caps or decay on voting power, delegated voting with transparent rotation, and conflict-of-interest registers.

Specify privacy-by-design: selective disclosure for investors and regulators, with public meta-logs for proposals and outcomes to preserve trust without exposing trade secrets.

Choose enterprise-grade consensus in permissioned settings for low latency and energy footprint, and limit public-chain exposure to modules where composability is essential and risk can be isolated.

### 2.3.2. Key performance indicators for evaluation

1. Investor-facing: time to disclosure of governance decisions, verifiable audit trail completeness, capital raised from ESG-aligned sources.
2. Participation: voter turnout, unique voter count, proposal throughput and cycle time, distribution of voting power.
3. Operational: decision latency, incident rate from governance errors, cost per approved proposal, privacy breach incidents.
4. Compliance: percentage of decisions with complete evidence packs, time to regulator verification, adherence to endorsement policies.

#### 2.3.2.1. Evidence base

Centralized marketplaces deliver strong digital trust and privacy through a single governor but constrain multi-organization automation and rapid expansion; a decentralized marketplace distributes governance across organizations and therefore requires robust mechanisms for identity, trust, and privacy to sustain execution guarantees (Tkachuk, 2023).

In permissioned ecosystems, the regulator or designated authority frequently becomes the effective trusted third party, anchoring identity and endorsement policies while enabling privacy-preserving execution. This improves performance and energy efficiency but can reduce universal auditability of private transactions without compensating audit design (Tkachuk, 2023).

Open, public-chain governance benefits from composability and transparent on-chain processes, which can strengthen network effects and participation. Yet it operates in adversarial conditions, with risks of token concentration, collusion, and manipulation that require explicit governance and monitoring controls to protect integrity and investor confidence (von Wachter, 2023).

Trust and assurance services remain pivotal in any blockchain-enabled governance, whether centralized, hybrid, or decentralized. The role of trust service providers and governance services must be clearly defined to maintain integrity, accountability, and dispute resolution across organizational boundaries.

## 2.4. Risks and Opportunities in Transition

The transition from a traditional hierarchical governance model to a decentralized framework presents both significant opportunities and notable risks for VIRIDIS. On the one hand, decentralization offers transparency, inclusiveness, and stakeholder empowerment, aligning with the European Union’s broader push for sustainability and democratic participation in corporate governance. On the other, it introduces technological, regulatory, and organizational uncertainties that must be carefully managed. More details are provided in *Appendix A.3: Risks & Opportunities and Financial and Investment Barriers*.

The Risk and Opportunity Matrix (see Figure 4) so does the SWOT (see Figure 5, more details can be found in the appendix section risk and opportunities) demonstrate that VIRIDIS’ transition to decentralized governance presents both high-impact opportunities and critical risks. On the opportunity side, the most significant gains lie in access to sustainable finance and enhanced stakeholder engagement, both highly likely and transformative for growth. Competitive differentiation and scalability are also promising, though less immediate.

On the risk side, regulatory uncertainty and financial/operational risks emerge as the most pressing threats, given their high likelihood and impact. Technological complexity and governance fragmentation pose additional challenges, though they can be managed through careful system design, pilot testing, and targeted training programs.

Overall, the analysis highlights that VIRIDIS can unlock major advantages if it seizes opportunities proactively, while ensuring a phased rollout, proactive regulatory alignment, and robust governance safeguards to mitigate the most critical risks.

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Figure 4 Risk & Opportunity Matrix VIRIDIS S.Geissler (2025)

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Figure 5 SWOT Analysis: Decentralized vs. Traditional Governance

In summary, the transition to decentralized governance is a double-edged sword. Opportunities such as greater access to sustainable investment flows, stronger stakeholder engagement, and competitive differentiation are considerable. However, regulatory, technological, and cultural risks require a carefully phased implementation strategy. This should be supported by pilot testing, clear governance frameworks, and proactive dialogue with regulators. If managed effectively, the transition could transform Viridis into a frontrunner in sustainable governance and investment attraction.

## 3. Scope and Limitations

### 3.1. Scope of the Project

The scope of this thesis is defined by VIRIDIS’s strategic ambition to attract more sustainable investment through the implementation of an improved governance model. Specifically, the project focuses on evaluating and designing a transition pathway from a traditional hierarchical governance structure toward a decentralized governance model, with particular emphasis on DAO-inspired mechanisms.

The project scope includes the following dimensions:

1. Governance Model Analysis

Critical evaluation of VIRIDIS’s current governance structure, including decision-making processes, oversight mechanisms, and transparency practices.

Comparative analysis of centralized, hybrid, and decentralized governance models, benchmarked against industry standards and emerging practices.

1. Stakeholder Engagement

Identification, mapping, and classification of internal and external stakeholders, including employees, managers, investors, policymakers, and NGO partners.

1. Assessment of stakeholder needs, motivations, and potential participation in decentralized governance processes.
2. Sustainable Finance Alignment

Exploration of how decentralized governance structures can enhance VIRIDIS’s alignments with EU’s sustainable finance regulations, such as the EU Taxonomy, ESG discolours structure, and the European Green Deal investment agenda. Demonstration of how governance reform could improve VIRIDIS’s attractiveness to both institutional and private investors.

1. Solution Design and Prototyping

Development of a tailored governance framework for VIRIDIS, combining decentralized decision-making with compliance-oriented safeguards.

Iterative ideation and testing of governance prototypes, including token-based voting mechanisms, stakeholder dashboards, and transparency tools.

1. Business Case Development

Construction of a multi-value business case, integrating financial (CAPEX, OPEX, ROI) and non-financial (trust, inclusivity, compliance readiness) indicators.

Modelling of different rollout scenarios (best case, normal case, worst case) to assess risks, opportunities, and long-term viability.

1. Implementation Roadmap

Phased strategy for introducing decentralized governance in VIRIDIS, starting with pilot projects and gradually scaling toward ecosystem-wide adoption.

Recommendations for governance safeguards, risk mitigation, and communication strategies to ensure adoption across stakeholder groups.

The scope is therefore both practical and forward-looking, bridging theoretical governance frameworks with actionable recommendations for VIRIDIS By keeping the focus on governance innovation as a lever for sustainable finance, the project remains tightly aligned with VIRIDIS’s immediate needs and long-term ambitions.

This research is conducted as a single case study of VIRIDIS, with its governance transition as the primary unit of analysis. The analysis is bounded to the organizational level, examining VIRIDIS’s internal governance, stakeholder engagement, and investor relationships. Broader sector-wide transformations and macroeconomic factors such as the European Green Deal, ESG disclosure regulations, and sustainable finance market trends are acknowledged only as contextual background. They provide the external setting in which VIRIDIS operates but are not the direct subject of analysis.

Although the unit of analysis is VIRIDIS, its governance transition is situated within macro-level shifts in sustainable finance and EU governance reforms. The case therefore provides illustrative insights into sectoral challenges and opportunities, even if the findings are not directly generalisable across the entire green technology industry.

The scope is therefore practical and forward-looking, bridging theoretical governance frameworks with actionable recommendations for VIRIDIS. By keeping the focus on governance innovation as a lever for sustainable finance, the project remains tightly aligned with VIRIDIS’s immediate needs and long-term ambitions.

### 3.2. Out of Scope

While this thesis provides an in-depth exploration of governance reform as a pathway to attract sustainable investment for VIRIDIS, several areas are intentionally excluded from its scope to maintain clarity and feasibility:

1. Operational Management of Projects  
     
   The research does not evaluate or redesign VIRIDIS’s internal project management methodologies, supply chain logistics, or day-to-day operational processes unrelated to governance.
2. Technology Development Beyond Governance Tools  
     
   Although blockchain-based governance mechanisms (e.g., token voting, DAO dashboards) are considered, the design and development of entirely new blockchain platforms or infrastructure layers is beyond the scope. Instead, the focus remains on leveraging existing technologies and governance frameworks.
3. Full Legal and Regulatory Reform  
     
   This project does not attempt to resolve all uncertainties around the legal recognition of DAOs or decentralized governance under EU law. Instead, it assesses implications for VIRIDIS and provides recommendations for regulatory alignment within the current EU sustainable finance framework.
4. Human Resource and Cultural Change in Detail  
     
   While employee and stakeholder inclusion are assessed, the thesis does not provide a detailed change management or HR transformation plan. Such organizational development initiatives fall outside the boundaries of this study.
5. Technical Security Audits  
     
   The project does not include cryptographic or cybersecurity audits of blockchain platforms. Technical risks are acknowledged at a conceptual level, but detailed penetration testing or code auditing lies outside the project’s scope.
6. Non-Green Tech Investment Areas  
     
   The analysis is limited to governance structures that impact green technology investment and does not extend to unrelated business units or markets that Viridis may pursue in the future.

By clearly delineating these exclusions, the project remains focused on the central research problem: whether and how decentralized governance can enhance investment flows and stakeholder participation for VIRIDIS’s green technology mission.

## 3.3. Limitations

Although this thesis aims to provide a robust and practical governance framework for VIRIDIS, several limitations constrain the scope, methodology, and applicability of its findings:

1. Generalisability of Findings  
     
   The research is centered on VIRIDIS as a case study. While insights may be transferable to other organizations exploring decentralized governance, conclusions are not nessesarily universally generalisable across industries or regulatory environments.
2. Regulatory Ambiguity  
     
   The legal status of decentralized governance structures such as DAOs remains fluid within the EU. This study cannot definitively resolve regulatory uncertainties around liability, compliance, or enforceability, which may affect the feasibility of certain recommendations.
3. Data Availability and Reliability  
     
   The analysis relies on a combination of stakeholder interviews, internal company data, and secondary research. Limitations in data availability, particularly around confidential investment and governance practices, may restrict the depth of quantitative assessment.
4. Stakeholder Participation Bias  
     
   Findings from stakeholder engagement activities (e.g., workshops, surveys, interviews) may be influenced by participation bias, with more vocal or motivated stakeholders shaping outcomes disproportionately compared to less engaged groups.
5. Technological Constraints  
     
   While DAO-inspired mechanisms are explored conceptually and through prototyping, the study does not implement or test them at full organizational scale. Pilot results may therefore differ from long-term operational realities.
6. Financial Forecasting Uncertainty  
     
   The business case incorporates scenario modeling (best, normal, worst case), but financial forecasts inherently depend on assumptions about investor behavior, regulatory stability, and technology adoption. These assumptions may not hold in dynamic market conditions.
7. Time Horizon of Research  
     
   The research is conducted within the limited timeframe of the graduation project. As such, long-term impacts of decentralized governance, such as sustained cultural change or multi-year investment flows, cannot be fully evaluated within this study.
8. Complexity of Change Management  
     
   Transitioning governance structures involves deep cultural, organizational, and technical shifts. This thesis focuses primarily on governance and investment implications, leaving detailed change management strategies outside the analytical scope.

By acknowledging these limitations, the thesis ensures transparency in its methodology and findings, allowing readers and evaluators to assess the conclusions within their appropriate boundaries.

# 4. Problem Analysis and Research

## 4.1 Current Governance Setup

VIRIDIS currently operates under a traditional hierarchical governance structure. This model reflects a conventional organizational design where decision-making power and oversight responsibilities are concentrated at the executive and managerial levels. While such a structure offers clarity and accountability, it also presents critical challenges in attracting sustainable investment and engaging stakeholders in innovation projects.

A diagram of a company

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Visual 5 Current Governance system VIRIDIS S.Geissler (2025)

Structure

The governance framework is largely top-down. Strategic decisions are made by the board and executive team, with limited mechanisms for employee or stakeholder participation. This creates efficiency in execution but restricts inclusivity, often leaving investors and partners without visibility into the decision-making process.

Oversight Responsibilities

Oversight is exercised through periodic reporting and review meetings, typically focusing on financial performance and compliance. While this ensures regulatory adherence and managerial accountability, it lacks mechanisms for real-time transparency or multi-stakeholder feedback loops, which are increasingly expected in the context of EU sustainable finance.

Talent and Culture

The organizational culture is characterized by strong technical expertise in green technology development but comparatively weak stakeholder engagement practices. Employees and partners are rarely involved in governance decisions, limiting the firm’s ability to foster a sense of shared ownership. This gap has been observed to reduce motivation for cross-project participation and collaboration.

Infrastructure

VIRIDIS’s governance infrastructure relies on conventional corporate IT systems (reporting software, email communications, internal dashboards). These tools are functional for hierarchical governance but are not designed for decentralized participation, traceability of votes, or verifiable transparency—elements increasingly critical to attract ESG-focused capital.

Analysis of gaps

While the current governance structure provides stability and predictability, it creates several bottlenecks:

* Inclusion challenges: Stakeholders beyond the executive layer lack meaningful input into strategic directions.
* Transparency gaps: Decision-making processes are opaque to investors and partners, limiting trust and verifiability.
* Innovation barriers: Hierarchical rigidity slows adoption of new governance tools that could foster network effects across VIRIDIS’s ecosystem.

In light of these issues, the existing governance operating system is insufficient to meet the demands of EU sustainable finance frameworks or to maximize stakeholder engagement in green technology initiatives.

### 4.1.1. Structure and Oversight

VIRIDIS’s current governance model is built on a hierarchical structure with clearly defined reporting lines and centralized oversight. This framework follows conventional corporate governance practices, where authority is concentrated at the board of directors and executive management team, who set strategic direction, allocate resources, and monitor compliance. (S.Geissler, Interviews GP2, 2025).

Structure

* Board of Directors: Holds ultimate authority over strategic decisions, financial approvals, and long-term planning. Their role is primarily supervisory, with little direct involvement from stakeholders beyond shareholders.
* Executive Management: Responsible for translating board decisions into operational strategies. Decision-making power is concentrated in a small group of senior leaders.
* Middle Management and Teams: Execution and operational responsibilities are delegated downwards, but their influence on strategy or governance design is limited.
* Stakeholders: External actors, such as investors, partners, and employees, are largely absent from formal governance processes beyond standard reporting or compliance requirements.

Oversight

* Monitoring Mechanisms: Oversight is ensured through financial reporting, regulatory compliance reviews, and internal audits. While effective in safeguarding compliance, these mechanisms are retrospective rather than proactive.
* Accountability: Responsibility is centralized, ensuring clear accountability within the executive layer, but creating bottlenecks when decisions require speed or flexibility.
* Transparency Limitations: Reporting is typically provided to investors and stakeholders on a periodic basis, limiting opportunities for real-time insights or dynamic feedback loops.

Implications

This governance structure and oversight model provides stability and clarity but creates several critical shortcomings:

* Exclusion from Governance: Broader stakeholders, including employees and project partners, have minimal influence on strategic decisions.
* Slow Responsiveness: Centralized oversight slows down decision-making, particularly in rapidly changing markets like green technology.
* Investment Barrier: The lack of participatory oversight mechanisms reduces transparency, undermining VIRIDIS’s attractiveness to investors aligned with ESG and EU Green Deal financing principles.

In summary, the centralized structure and oversight mechanisms, while ensuring accountability, restrict inclusiveness, agility, and transparency—factors increasingly essential for attracting sustainable finance and scaling innovation.

### 4.1.2. Talent and Culture

The talent base and organizational culture at VIRIDIS form both a strength and a limitation in the current governance system. VIRIDIS employs a workforce with strong expertise in green technology innovation, sustainability, and engineering. This technical orientation has been critical for the company’s product development and operational growth. However, when it comes to governance and stakeholder inclusion, the existing culture reveals structural challenges. (S.Geissler, Interviews GP2, 2025).

Talent

* Technical Expertise: Employees and managers possess deep domain knowledge in renewable energy, sustainable materials, and eco-innovation. This creates a strong foundation for project execution but does not necessarily translate into governance skills.
* Governance Experience: Limited exposure to participatory or decentralized governance models. Most leaders have been trained in hierarchical corporate practices, with decision-making seen as an executive prerogative rather than a shared responsibility.
* Investor Relations: Communication between employees and external investors is mediated by senior management, leaving little room for direct engagement or co-creation of solutions.

Culture

* Top-Down Decision-Making: VIRIDIS’s culture reinforces hierarchy, with strategic input concentrated at the top. Employees are expected to follow directives rather than actively shape governance or company-wide innovation strategies.
* Limited Participation: Stakeholder engagement is largely transactional, through periodic reports or investor briefings, rather than collaborative. Employees and external partners often lack channels to contribute meaningfully to governance discussions.
* Innovation vs. Governance Divide: While VIRIDIS encourages creativity in technical problem-solving, it does not extend the same participatory approach to governance. As a result, innovation thrives in product development but lags in decision-making structures.
* Trust and Ownership Gaps: Because employees and partners are rarely invited into governance decisions, there is less sense of ownership over VIRIDIS’s strategic direction. This gap undermines the potential for collective motivation and active participation in long-term projects.

Implications

The current talent and culture dynamic provides VIRIDIS with a technically skilled workforce but fails to leverage that expertise in shaping governance. This misalignment has three main consequences:

1. Underutilized Stakeholder Knowledge: Valuable insights from employees and partners remain excluded from governance processes.
2. Weak Stakeholder Loyalty: Without opportunities for shared decision-making, VIRIDIS risks losing engagement and trust from both internal staff and external partners.
3. Barrier to Sustainable Investment: Investors increasingly evaluate not only technical capacity but also governance inclusivity and ESG alignment. VIRIDIS’s governance culture, as it stands, does not fully meet these expectations.

In summary, while VIRIDIS’s talent pool is strong in technical innovation, its governance culture remains narrowly hierarchical, limiting inclusivity, ownership, and attractiveness to sustainable finance stakeholders.

### 4.1.3 Infrastructure and Technology

VIRIDIS’s governance infrastructure is primarily designed to support traditional hierarchical decision-making, rather than participatory or decentralized processes. The company relies on conventional corporate tools and systems, which are efficient for compliance and reporting but insufficient for enabling transparency, inclusivity, and real-time collaboration. (S.Geissler, GP2 Research Report, 2025).

Infrastructure

* Communication Tools: Email, internal dashboards, and periodic reporting systems form the backbone of communication. While reliable, these tools reinforce one-way information flows from management to employees and investors, limiting opportunities for interactive engagement.
* Data Management: Information on performance, project status, and investment is centralized and controlled by management. This creates information asymmetry, where only a select group has full visibility into decision-making data.
* Oversight Systems: Traditional auditing and compliance software are used to monitor financial and operational performance. These systems ensure accountability but are retrospective, producing reports after decisions have already been made.

Technology

* Lack of Participatory Platforms: VIRIDIS does not yet employ digital platforms that enable stakeholder participation in governance, such as voting mechanisms, decision dashboards, or transparent project-tracking tools.
* Limited Transparency Features: Existing systems are not designed to provide immutable records of decisions, nor do they offer mechanisms for stakeholders to verify governance outcomes independently.
* Innovation Gap: While VIRIDIS invests heavily in technological innovation for its green products, the same emphasis is not placed on digital governance tools. This gap creates a disconnect between the company’s external positioning as a green innovator and its internal governance practices.

Implications

The current infrastructure and technology landscape at VIRIDIS leads to several governance challenges:

1. Transparency Deficit: Stakeholders outside the executive layer cannot easily track or verify governance decisions.
2. Low Engagement: Without accessible, participatory platforms, employees, investors, and partners remain largely passive in governance processes.
3. Investment Barrier: ESG-focused investors increasingly expect transparent governance systems supported by traceable digital tools. VIRIDIS’s reliance on traditional systems may reduce its competitiveness in attracting sustainable finance.
4. Scalability Concerns: As VIRIDIS grows and pursues larger projects, the limitations of centralized and retrospective systems will exacerbate inefficiencies and slow decision-making.

In summary, VIRIDIS’s infrastructure and technology are adequate for compliance-driven hierarchical governance but inadequate for decentralized, transparent, and participatory models. Addressing this gap is essential if VIRIDIS is to align with EU sustainable finance standards and attract broader stakeholder investment.

## 4.2 Assessment of Gaps in Decision-Making and Inclusion

The current governance system at VIRIDIS highlights several structural and cultural gaps that hinder effective stakeholder participation, transparency, and alignment with sustainable finance expectations. These gaps not only reduce the company’s attractiveness to ESG-driven investors but also limit its ability to harness the network effects of stakeholder collaboration (S.Geissler, GP2 Research Report, 2025).

1. Centralization of Authority

* Decision Bottlenecks: Strategic decisions are concentrated in the hands of the board and executive team. This creates efficiency for top-down directives but prevents broader stakeholder input.
* Exclusion of Employees and Partners: Employees, project partners, and smaller investors lack formal channels to contribute to governance, despite being key to project execution and ecosystem growth. Email is the only communication chanel at the moment.

2. Limited Inclusion Mechanisms

* Lack of Participatory Tools: VIRIDIS has not adopted platforms (e.g., token-based voting, decision dashboards) that allow stakeholders to participate meaningfully in governance processes.
* Information Asymmetry: Only senior management has access to comprehensive project and financial data. This imbalance reduces trust and diminishes stakeholders’ ability to make informed contributions.

3. Transparency Deficits

* Opaque Processes: Governance decisions are communicated retrospectively through reports rather than transparently in real time.
* Investor Concerns: ESG-focused investors increasingly require traceable, verifiable decision-making. Viridis’s current system falls short of providing these assurances.

4. Cultural Barriers to Participation

* Top-Down Norms: Organizational culture prioritizes execution over inclusion. Employees are expected to follow rather than co-create strategy, undermining collective ownership.
* Trust Gap: The absence of participatory mechanisms fosters disengagement, weakening loyalty and long-term commitment among stakeholders.

5. Innovation vs. Governance Disconnect

* Technical vs. Governance Innovation: VIRIDIS demonstrates excellence in green technology development but fails to apply the same innovative approach to governance. This disconnect creates a credibility gap: while the company presents itself as a sustainability leader, its governance practices do not reflect the transparency and inclusivity demanded by sustainable finance frameworks.

Implications

The assessment reveals three critical consequences:

1. Reduced Investment Potential: Investors aligned with the EU Green Deal and sustainable finance policies may hesitate to commit capital without transparent governance.
2. Weak Network Effects: By excluding stakeholders from governance, VIRIDIS misses the opportunity to strengthen participation across its ecosystem projects.
3. Strategic Vulnerability: Inflexible governance slows VIRIDIS’s ability to adapt to regulatory changes, market expectations, and ecosystem-driven innovations.

In conclusion, the current gaps in decision-making and inclusion constrain VIRIDIS’s growth trajectory and ability to attract sustainable investment. Addressing these weaknesses through participatory, decentralized governance models is essential for closing the investment gap and enhancing stakeholder engagement.

### 4.2.1 Hierarchical Limitations

VIRIDIS’s reliance on a hierarchical governance model creates structural inefficiencies and barriers to sustainable growth. While hierarchy provides clarity in authority and accountability, it also imposes several limitations that are increasingly incompatible with the demands of sustainable finance and stakeholder-driven innovation.

1. Decision-Making Bottlenecks

Strategic and operational decisions must pass through multiple management layers, slowing responsiveness to market opportunities and regulatory changes.  
  
The concentration of authority at the executive level reduces agility in addressing emerging sustainability challenges.

2. Lack of Inclusivity

Employees, investors, and external partners are excluded from shaping governance decisions.

This exclusion undermines Viridis’s ability to foster collective ownership and weakens the potential for cross-project collaboration.

3. Limited Transparency

Decision-making processes are opaque, communicated only through periodic reporting.  
  
Stakeholders cannot easily verify the rationale behind strategic choices, reducing trust in governance outcomes.

4. Weak Alignment with Sustainable Finance Standards

EU frameworks such as the Sustainable Finance Disclosure Regulation (SFDR) and the EU Taxonomy emphasize transparency, inclusivity, and measurable ESG impact.  
  
VIRIDS’s hierarchical model does not provide the participatory structures or traceability required to demonstrate compliance with these evolving standards.

5. Cultural Rigidity

The governance culture reinforces “top-down” norms, discouraging participatory practices and innovation in decision-making.

Over time, this rigidity risks alienating employees and external stakeholders who expect more collaborative and transparent engagement.

Implications

The hierarchical limitations of VIRIDIS’s governance structure create three strategic risks:

1. Investment Deterrence – ESG-focused investors are less likely to commit funds without evidence of transparent, participatory governance.
2. Reduced Stakeholder Engagement – Stakeholders lack incentives to actively participate in VIRIDIS’s ecosystem projects, weakening the network effect.
3. Strategic Vulnerability – The hierarchical model is poorly equipped to adapt to the decentralized governance trends emerging across industries.

In summary, while hierarchy provides order and control, it significantly restricts Viridis’s ability to build trust, attract sustainable investment, and foster active participation—elements that are increasingly critical for long-term competitiveness.

### 4.2.2 Transparency and Communication Gaps

Transparency and effective communication are essential components of modern governance, particularly for organizations seeking alignment with EU sustainable finance frameworks and the expectations of ESG-focused investors. At VIRIDISs, however, significant shortcomings in these areas hinder trust, participation, and investment attractiveness.

1. Opaque Decision-Making

Governance decisions are primarily communicated through retrospective reports rather than real-time updates.

Stakeholders—including employees, partners, and investors—lack access to the reasoning behind strategic choices, making decisions appear top-down and disconnected.

2. Information Asymmetry

Senior management retains control over key financial, strategic, and project-related data.

This imbalance prevents employees and external stakeholders from contributing meaningfully to decision-making, reinforcing a passive role.

3. Limited Feedback Mechanisms

Communication between management and stakeholders is one-directional: decisions are announced but rarely co-created.

Mechanisms for feedback, such as surveys or workshops, exist sporadically but do not systematically influence governance outcomes.

4. Investor Expectations Unmet

ESG-driven investors increasingly demand traceable, verifiable governance processes to ensure compliance with sustainability regulations (e.g., EU Taxonomy, SFDR).

VIRIDIS’s reliance on closed reporting systems fails to meet these transparency requirements, creating a potential barrier to securing green investment.

5. Technology Underutilization

Current digital infrastructure is not designed for open communication or traceable decision records.

Without participatory platforms such as dashboards or voting systems, stakeholders cannot verify governance processes independently.

Implications

The communication and transparency gaps in VIRIDIS’s governance create three major risks:

1. Erosion of Trust – Stakeholders may perceive governance as opaque or exclusionary, undermining loyalty and confidence.
2. Investment Barrier – Lack of verifiable transparency makes it harder to attract and retain ESG-focused investors.
3. Missed Participation Opportunities – Weak feedback loops prevent VIRIDIS from harnessing the knowledge and commitment of its wider stakeholder base.

In summary, the current governance model at Viridis lacks the clarity, accountability, and participatory communication structures needed to meet both internal engagement needs and external sustainable finance expectations.

### 4.2.3 Technology Adoption Challenges

VIRIDIS has established itself as a pioneer in developing green technologies, but its governance systems reveal significant resistance and structural barriers to adopting digital tools that could enable more inclusive and transparent decision-making. This paradox is innovation in product development versus stagnation in governance technology, creates a credibility gap and limits VIRIDIS’s ability to align with sustainable finance expectations.

1. Legacy Systems

Governance still relies on traditional IT infrastructure such as email, reporting software, and compliance tools.  
  
These systems are functional for hierarchical oversight but are not designed for participatory processes such as token-based voting, real-time dashboards, or verifiable decision logs.

2. Cultural Resistance

A hierarchical governance culture discourages experimentation with participatory technologies.  
  
Leaders tend to view decision-making as an executive privilege, creating hesitancy to adopt digital tools that would distribute authority.

3. Skills Gap

While VIRIDIS employs strong technical talent in sustainability and engineering, there is limited internal expertise in blockchain governance tools, DAO frameworks, or participatory decision platforms.  
  
This lack of governance-specific technical knowledge creates dependency on external experts, increasing costs and slowing adoption.

4. Perceived Risks

Concerns about cybersecurity, compliance, and reputational risk lead to hesitation in adopting blockchain-based governance tools.  
  
Without clear regulatory guidance, management perceives participatory technologies as too uncertain for immediate integration.

5. Integration Challenges

VIRIDIS’s existing systems are not interoperable with decentralized tools, making implementation costly and complex.  
  
Scaling such systems would require restructuring not just technology but also workflows, incentives, and governance culture.

Implications

The challenges in adopting governance-related technologies result in:

1. Stagnation in Governance Innovation – VIRIDIS fails to translate its green-tech leadership into governance innovation, undermining credibility with investors.
2. Barrier to Stakeholder Engagement – Without digital tools for participation, stakeholders remain excluded from governance processes.
3. Strategic Vulnerability – As EU sustainable finance increasingly emphasizes transparency, accountability, and digital traceability, Viridis risks falling behind competitors who adopt governance technologies earlier.

In summary, VIRIDIS’s technology adoption challenges stem from legacy systems, cultural resistance, and regulatory uncertainty. Overcoming these barriers is critical if the company is to align its governance model with sustainable finance trends and attract the investment needed for long-term survival.

4.3 Key Insights and Takeaways

The assessment of VIRIDIS’s current governance system highlights several structural, cultural, and technological limitations that directly impact the company’s ability to attract sustainable investment and foster broad stakeholder participation. From this analysis, several key insights and takeaways emerge that are critical for designing a more inclusive and future-proof governance model.

1. Centralization vs. Inclusivity

VIRIDIS’s hierarchical model ensures accountability and control but excludes stakeholders—employees, investors, and partners—from meaningful participation.

This exclusion undermines trust and prevents VIRIDIS from harnessing the network effects essential for scaling collaborative green technology projects.

2. Transparency as a Strategic Imperative

Current communication and reporting systems are retrospective and opaque.

Transparency, supported by verifiable governance tools, is increasingly non-negotiable for ESG-focused investors and is central to EU sustainable finance regulations.

3. Governance Innovation Gap

While VIRIDIS demonstrates leadership in developing green technologies, its governance practices lag behind.  
  
This disconnect weakens the company’s credibility: investors expect innovation in governance to match innovation in products and services.

4. Technology and Adoption Barriers

Reliance on legacy systems, cultural resistance, and regulatory ambiguity limit the adoption of participatory governance tools such as DAOs or blockchain-enabled voting systems.  
  
Without addressing these barriers, VIRIDIS risks falling behind competitors who are experimenting with decentralized governance.

5. Strategic Risks and Opportunities

Risks: Loss of stakeholder trust, reduced attractiveness to sustainable investors, and slower adaptability to regulatory change.  
  
Opportunities: By embracing participatory governance models, Viridis can position itself as an early mover in governance innovation, differentiate from competitors, and attract capital aligned with the EU Green Deal.

The Takeaway is, VIRIDIS’s survival and growth in the green technology sector will depend not only on its capacity to innovate in products but also on its ability to transform governance into a transparent, inclusive, and participatory system. Addressing the identified gaps provides a direct pathway to increasing stakeholder engagement, securing sustainable investment, and ensuring long-term competitiveness in a rapidly evolving regulatory and market landscape.

5. Stakeholder Analysis, Mapping, and Engagement

## 5.1 Identification of Key Stakeholders

For VIRIDIS, stakeholders represent the core ecosystem that determines both its operational success and its ability to attract sustainable investment. Identifying these groups is critical for understanding governance needs, participation levels, and the potential impact of transitioning toward a more decentralized model. Stakeholders can be categorized into internal, external–direct, and external–indirect groups. More details can be found in the appendix in section A.1 Detailed Stakhodler analysis.

## 5.2. Stakeholder Mapping (Direct and Indirect)

Stakeholder mapping provides a structures way to visualize how different groups influence and are influenced by VIRIDIS’s governance system. By disguising between direct and indirect stakeholders, VIRIDIS can prioritise engagement strategies and design governance mechanisms that balance authority, participation, and legitimacy.

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Figure 6 Stakeholder map of VIRIDIS governance transition. Internal, direct external, and indirect external stakeholders are positioned relative to VIRIDIS as the central case organization S.Geissler (2025)

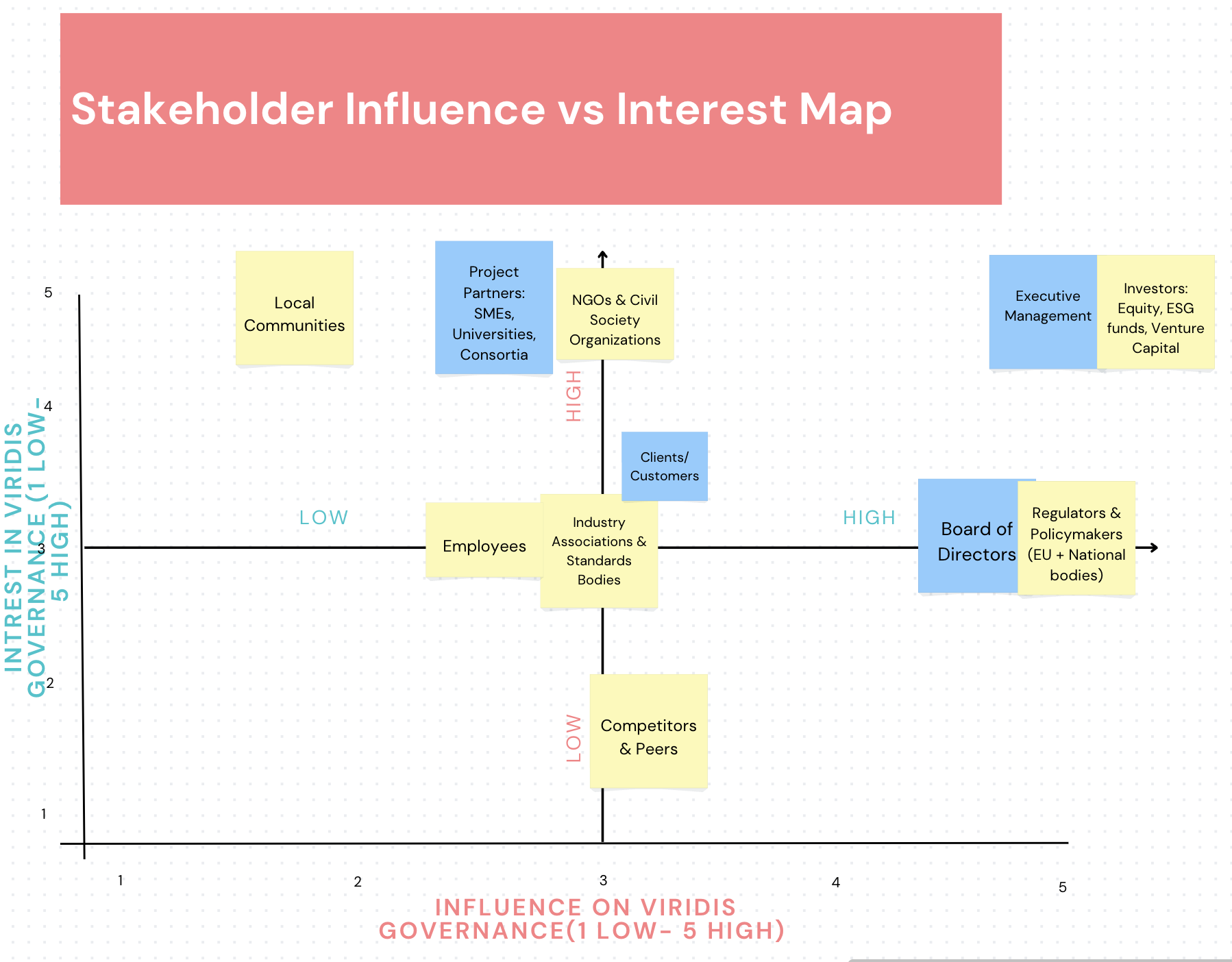


Figure 7 Stakeholder Influence vs Interest Map S.Geissler 2025

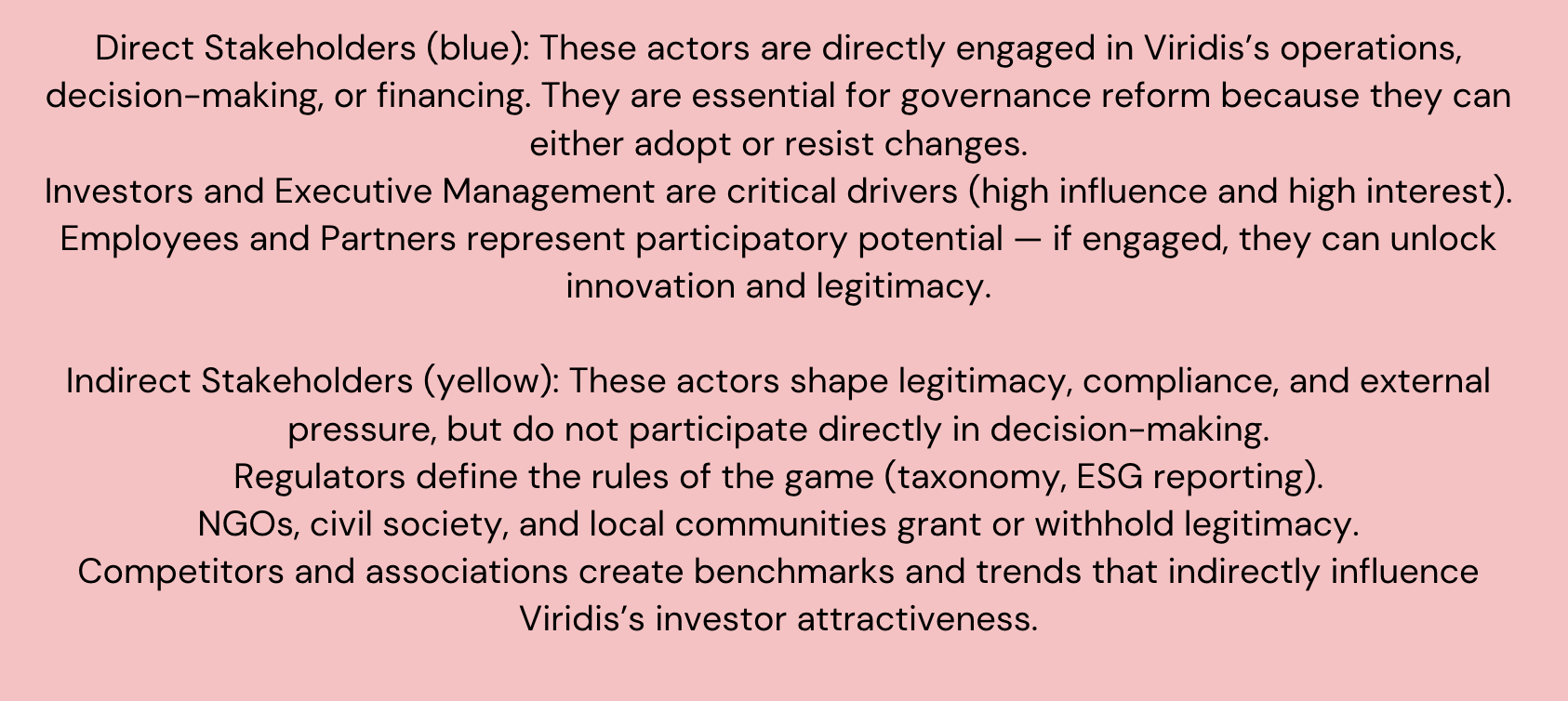


Figure 8 Stakeholder Influence vs Interest Map Explanation ,S.Geissler 2025

Mapping Overview: Influence vs. Interest

High Influence / High Interest: Investors, Executive Management → Priority stakeholders for governance transformation.

High Influence / Medium Interest: Board of Directors, Regulators → Must be managed closely and convinced of governance reforms.

Medium Influence / High Interest: Employees, Project Partners, NGOs → Require structured participation channels to unlock engagement and network effects.

Medium Influence / Medium Interest: Clients, Industry Associations → Important for long-term trust and alignment but secondary in governance reform.

Low Influence / High Interest: Local Communities → Must be informed and considered to maintain legitimacy and avoid reputational risks.

Implications

1. Investors and Regulators: Their combined pressure for transparency and accountability creates the strongest incentive for reform.
2. Employees and Partners: Engagement here is critical to shift culture toward inclusion and participatory governance.
3. NGOs and Civil Society: Early involvement strengthens credibility and may help secure ESG endorsements.
4. Board and Executives: Resistance at this level could stall reforms, making internal buy-in a strategic necessity.

5.3 Engagement Levels and Classifications

Effective governance reform at VIRIDIS requires not only identifying stakeholders but also clarifying how each group should be engaged. Using an adaptation of the International Association for Public Participation (IAP2) Spectrum—Inform, Consult, Involve, Collaborate, Empower—Viridis can design differentiated strategies that match stakeholder influence, interest, and legitimacy.

Internal Stakeholders

1. Board of Directors  
   Engagement Level: Collaborate  
   Must co-create the governance transformation strategy and approve integration of decentralized mechanisms.  
   Their authority is vital for institutionalizing reforms.
2. Executive Management  
   Engagement Level: Collaborate/Involve  
   Should actively participate in design workshops and early pilots, ensuring alignment with operational structures.
3. Employees  
   Engagement Level: Involve/Empower (long term)  
   Begin with inclusion in pilot decision-making tools (voting platforms, participatory dashboards).  
   Long-term goal: empower employees to propose, vote, and co-develop governance initiatives.

External – Direct Stakeholders

Investors (Equity, ESG funds, Venture Capital)

* + Engagement Level: Consult/Collaborate
  + Require transparent communication of governance reforms and opportunities to shape reporting mechanisms.
  + Their support is essential for financing the transition.

Project Partners (SMEs, Universities, Consortia)

* + Engagement Level: Involve
  + Involve them in participatory governance related to joint projects, ensuring alignment of incentives.

Clients/Customers

* + Engagement Level: Inform/Consult
  + Keep them informed of governance reforms to strengthen trust and market credibility.
  + Consult selectively where customer trust is directly tied to governance outcomes (e.g., ESG compliance).

External – Indirect Stakeholders

Regulators and Policymakers (EU, National authorities)

* + Engagement Level: Consult
  + Ensure compliance with sustainable finance frameworks (EU Taxonomy, SFDR, CSRD).
  + Consultations reinforce Viridis’s credibility and alignment with policy goals.

NGOs and Civil Society Organizations

* + Engagement Level: Involve
  + Invite participation in advisory boards, reporting reviews, and pilot evaluations to gain legitimacy.

Industry Associations and Standards Bodies

* + Engagement Level: Inform/Consult
  + Keep informed on progress and consult for alignment with industry governance standards.

Competitors and Peers

* + Engagement Level: Inform (indirect)
  + Limited active engagement, but strategic transparency can influence industry adoption and positioning.

Local Communities

* + Engagement Level: Involve
  + Directly involve in projects affecting environmental and social outcomes. Engagement builds trust and ensures Viridis maintains its social license to operate.

Implications for Governance Transition

1. High-Priority Groups (Investors, Employees, Regulators, Board, Management) must be directly engaged through collaboration or empowerment strategies.
2. Legitimacy Builders (NGOs, Partners, Local Communities) should be involved to strengthen trust and ecosystem credibility.
3. Secondary Influence Groups (Clients, Associations, Competitors) can be managed with information-sharing and selective consultation.

This classification ensures that engagement is not symbolic but structurally embedded in the transition to decentralized governance.

## 5.4 Multi-Perspective Change Scenarios

To ensure the transition toward decentralized governance is robust, VIRIDIS must anticipate how different stakeholder groups will experience, react to, and influence change. By analyzing scenarios from multiple perspectives, the company can identify enablers, risks, and opportunities for adoption.

1. Board of Directors

Scenario: Board members may resist decentralization, viewing it as a dilution of authority.

Opportunity: Demonstrating how decentralized governance increases investor confidence and aligns with EU sustainable finance regulations could secure board approval.

Risk: Without early buy-in, reforms could stall at the top level.

2. Executive Management

Scenario: Management may initially see decentralization as a threat to control but could also benefit from reduced bottlenecks and faster decision cycles.

Opportunity: Positioning the model as a tool that improves efficiency, compliance, and reporting can foster acceptance.

Risk: If poorly implemented, management may feel bypassed and disengage from the transition.

3. Employees

Scenario: Employees gain more voice in decision-making through voting tools and participatory dashboards.

Opportunity: Increased sense of ownership fosters innovation, collaboration, and retention.

Risk: If processes are overly complex, employees may disengage, leading to participation fatigue.

4. Investors (ESG Funds, Venture Capital, Equity Holders)

Scenario: Transparent, traceable governance strengthens Viridis’s ESG profile, making it more attractive to sustainable finance.

Opportunity: Investors reward governance innovation with increased funding and long-term commitment.

Risk: If technology adoption lags, investors may perceive governance reform as symbolic rather than substantive.

5. Project Partners (Universities, SMEs, Consortia)

Scenario: Partners are included in governance decisions for joint projects via transparent digital tools.

Opportunity: Builds stronger alliances and enhances credibility in EU-funded collaborations.

Risk: If inclusion mechanisms are inconsistent, trust may erode and partnerships weaken.

6. Regulators and Policymakers

Scenario: Governance transparency supports alignment with SFDR, EU Taxonomy, and CSRD.

Opportunity: Viridis gains early compliance advantages, positioning itself as a governance leader.

Risk: If systems do not meet evolving regulatory standards, Viridis risks penalties or exclusion from green finance eligibility.

7. NGOs and Civil Society

Scenario: NGOs gain visibility into Viridis’s governance, potentially endorsing its transparency.

Opportunity: Legitimacy and reputation improve, boosting trust among investors and customers.

Risk: NGOs may critique tokenized governance if it excludes vulnerable groups or lacks accountability safeguards.

8. Local Communities

Scenario: Communities affected by Viridis’s operations gain voice in relevant decisions.

Opportunity: Strengthens Viridis’s social license to operate and mitigates opposition.

Risk: Failure to include community input risks reputational backlash and operational delays.

Takeaway

These multi-perspective scenarios show that the same governance reform can be perceived as empowering, threatening, or symbolic depending on the stakeholder. A successful transition requires tailored engagement strategies that:

Secure board and management buy-in,

Simplify participation for employees and partners,

Demonstrate compliance and transparency to investors and regulators, and

Build legitimacy through NGO and community involvement.

# 6. Solution Design and Development

6.1 Introduction to the Governance Operating Model

The governance operating model defines the structures, processes, and technologies that shape how decisions are made, who participates, and how accountability is ensured within Viridis. As the company faces increasing pressure to attract sustainable finance, its traditional hierarchical model—while effective for control—has proven insufficient in fostering inclusion, transparency, and investor confidence.

The proposed operating model introduces a shift from a centralized, top-down system toward a decentralized, participatory framework inspired by decentralized autonomous organization (DAO) principles. This framework integrates both traditional governance safeguards (oversight, compliance, fiduciary responsibility) and decentralized tools (tokenized participation, traceable decision logs, real-time dashboards). Research suggests that decentralized structures can improve trust, engagement, and resilience, while blockchain-based governance mechanisms provide verifiability and transparency that traditional systems often lack (Beck et al., 2018; De Filippi & Wright, 2018; Glaser, 2021).

Key Principles of the Proposed Model

1. Transparency by Design  
     
   All governance decisions are recorded in traceable, auditable digital platforms.  
   Dashboards provide stakeholders, employees, investors, and partners,real-time access to decisions and outcomes (Glaser, 2021).
2. Inclusion and Participation

Decision-making expands beyond the boardroom to include employees, investors, and selected external partners.

Participation is enabled through digital voting mechanisms and stakeholder councils, reflecting DAO governance practices (Hsieh et al., 2018).

1. Accountability and Oversight  
     
   Traditional oversight remains with the Board and Executive Management but is supplemented by decentralized transparency tools, ensuring checks and balances.  
   Clear role definitions prevent decision paralysis or diffusion of responsibility.
2. Scalability and Adaptability  
     
   The model is designed to evolve as Viridis grows, with the ability to integrate new stakeholders and technologies.  
   Phased adoption allows for gradual cultural and technical transition (Beck et al., 2018).
3. Alignment with Sustainable Finance Regulations  
     
   By embedding ESG reporting standards (SFDR, EU Taxonomy, CSRD) directly into governance processes, Viridis strengthens its eligibility for green finance (European Commission, 2020; EU Technical Expert Group on Sustainable Finance, 2020).  
   Investors gain assurance that governance practices are not symbolic but structurally embedded in compliance and transparency (Flammer, 2021).

Framework Overview

* Strategic Layer: Board of Directors retains high-level authority but operates with transparent digital oversight.
* Operational Layer: Executive Management coordinates daily governance, supported by participatory dashboards and decision tools.
* Participatory Layer: Employees, partners, and selected external stakeholders engage in structured decision-making processes.
* Technological Backbone: Blockchain-enabled tools, digital identity management, and voting platforms ensure secure, transparent participation.

Implications for VIRIDIS

The introduction of this governance operating model positions Viridis as a pioneer in governance innovation within the green tech industry. It strengthens trust, fosters broader engagement, and enhances investment attractiveness by demonstrating a governance framework that is not only sustainable in its outcomes but also in its design.

## 6.2 Gap Analysis from GP3 Research

The findings from the GP3 research highlight critical governance weaknesses that directly limit Viridis’s ability to attract sustainable investment and broaden stakeholder engagement. These gaps demonstrate the misalignment between Viridis’s centralized governance structure and the requirements of modern sustainable finance and decentralized participation models.

Key Gaps Identified

1. Concentration of Decision-Making Power
   * Current governance relies heavily on board- and management-led decisions, leaving little room for wider stakeholder involvement.
   * This creates inefficiencies and a lack of innovation due to limited perspectives (Beck et al., 2018).
2. Low Stakeholder Participation
   * Employees and project partners reported a lack of mechanisms to influence company strategy, resulting in disengagement and missed opportunities for collaboration.
   * This weakens VIRIDIS’s potential to leverage network effects, which are central to decentralized governance systems (Glaser, 2021).
3. Transparency Deficits
   * The report identified insufficient communication of strategic priorities and unclear processes for resource allocation.
   * These deficits reduce trust from investors, employees, and external collaborators, particularly in a regulatory context where transparency is increasingly mandatory (Flammer, 2021).
4. Technology Adoption Challenges
   * Viridis’s current infrastructure does not support participatory digital platforms such as token-based voting or traceable dashboards.
   * This technological lag makes the transition to decentralized governance both urgent and resource-intensive (Hsieh et al., 2018).
5. Misalignment with Sustainable Finance Expectations
   * Investors increasingly demand demonstrable ESG compliance and participatory governance mechanisms.
   * The GP3 findings show that VIRIDIS has not yet embedded EU frameworks (SFDR, CSRD, EU Taxonomy) into its governance processes, reducing its attractiveness to sustainable finance markets (European Commission, 2020).

Summary of Gaps

Structural Gap: Centralized, hierarchical system vs. need for decentralized participation.  
Cultural Gap: Limited inclusion of employees and partners vs. demand for co-creation.  
Technological Gap: Lack of digital governance tools vs. requirements for secure, transparent participation.  
Regulatory Gap: Weak ESG integration vs. mandatory EU sustainable finance frameworks.

Implications for Solution Design

Addressing these gaps requires a governance operating model that:

* Expands participation beyond executives and board members,
* Embeds transparency and traceability into all decision-making processes,
* Integrates sustainable finance requirements into governance reporting,
* Leverages decentralized tools (e.g., DAO-inspired participation platforms) to rebuild investor confidence and activate stakeholder engagement.

6.3 Ideation Process and Design Criteria

### 6.3.1. Iteration Round 1: Idea Generation

The ideation process for VIRIDIS’s governance transformation was structured around design thinking principles, with an emphasis on creativity, inclusivity, and feasibility. This stage built upon the gap analysis from GP2 research and explored potential governance solutions that could address structural, cultural, technological, and regulatory weaknesses. (GP2 Research report, S.Geissler)

The first iteration round focused on generating a wide range of ideas without immediately narrowing them down. Stakeholders from across VIRIDIS including management, employees, and external advisors—were invited to participate in brainstorming sessions and digital workshops. Using tools such as the SCAMPER method (Substitute, Combine, Adapt, Modify, Put to another use, Eliminate, Reverse) (Michalko, 2006), participants were encouraged to challenge existing assumptions and envision alternative governance approaches.

Key Ideas from Iteration Round 1

1. DAO-Inspired Participation Platform
   * Implement a blockchain-based platform allowing employees and partners to propose and vote on strategic initiatives.
   * Ensures traceability and transparency of all governance decisions.
2. Stakeholder Councils
   * Establish councils composed of employees, investors, and project partners to advise management and the board on governance reforms.
   * Provides structured inclusion of diverse perspectives.
3. Real-Time Transparency Dashboards
   * Develop dashboards to publicly display governance decisions, financial flows, and sustainability metrics.
   * Increases accountability and improves investor trust.
4. Hybrid Governance Model
   * Combine centralized oversight (board authority, fiduciary duties) with decentralized decision-making (tokenized participation, voting rights).
   * Creates balance between compliance and innovation.
5. Tokenized Incentives for Engagement  
   * Introduce participation tokens to reward employees and partners for contributing to governance processes.
   * Encourages sustained engagement and builds a culture of co-creation.
6. Governance Sandbox
   * Pilot decentralized tools in controlled environments before scaling across VIRIDIS.
   * Allows for experimentation while mitigating risks of disruption.

Design Criteria Emerging from Round 1

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Figure 9 Heatmap Iteration Round 1 Key Objectives & Business Impacts, S.Geissler (2025)

A screenshot of a computer screen

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Figure 10 Heatmap Iteration Round 1 Impact on governance Modle, S.Geissler (2025)

From these ideas, several design criteria were identified to guide the next iterations of governance model development:

1. Transparency – All decisions must be auditable and accessible.
2. Inclusion – Multiple stakeholder groups must be given structured opportunities to participate.
3. Accountability – Clear oversight mechanisms must remain in place to avoid governance paralysis.
4. Technological Feasibility – Solutions must be compatible with Viridis’s current infrastructure, with realistic cost projections.
5. Scalability – The governance model must adapt to organizational growth and new stakeholders.
6. Regulatory Alignment – Governance processes must comply with EU sustainable finance regulations (CSRD, SFDR, EU Taxonomy).

Outcome of Iteration Round 1

This round produced a portfolio of diverse concepts ranging from bold (DAO governance) to incremental (stakeholder councils, dashboards). The next stage of iteration will filter, combine, and refine these ideas based on feasibility, stakeholder feedback, and alignment with Viridis’s long-term strategic objectives.

### 6.3.2 Heatmap Analysis and Ratings

Following the first ideation round, VIRIDIS applied a heatmap evaluation method to assess and prioritize the generated ideas. The heatmap visually scores each idea against predefined design criteria—transparency, inclusion, accountability, technological feasibility, scalability, and regulatory alignment—enabling an evidence-based selection of the most promising governance innovations.

The evaluation was conducted through participatory workshops where stakeholders (management, employees, and advisors) assigned ratings on a 1–5 scale (1 = weak performance, 5 = strong performance). The heatmap method was chosen because it provides both a quantitative comparison and a visual representation of trade-offs between different governance options (Eppler & Platts, 2009).

Criteria Used for Ratings

1. Transparency – Ability to provide traceable, auditable decision-making.
2. Inclusion – Extent to which multiple stakeholders are engaged in governance.
3. Accountability – Clarity of oversight and responsibility structures.
4. Technological Feasibility – Compatibility with current infrastructure and resource demands.
5. Scalability – Adaptability of the solution as Viridis grows.
6. Regulatory Alignment – Compliance with EU sustainable finance frameworks (CSRD, SFDR, EU Taxonomy).

A diagram of a model evaluation

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Figure 11 HeatMap of Governance Modle S.Geissler 2025

Key Insights from Heatmap Analysis

* Hybrid Governance Model emerged as the strongest overall option (27/30). It balances traditional oversight with decentralized participation, making it both innovative and feasible.
* Real-Time Transparency Dashboards scored particularly high on transparency, scalability, and regulatory alignment, suggesting it is a low-risk, high-value innovation.
* DAO-Inspired Platforms scored high on transparency and inclusion but lower on feasibility and accountability, indicating they should be piloted in a controlled “sandbox” phase before full deployment.
* Stakeholder Councils remain a pragmatic solution, combining accountability with broad participation, making them a strong incremental step toward decentralization.
* Tokenized Incentives and Governance Sandboxes are valuable supporting mechanisms but scored lower overall, suggesting they should complement rather than lead the transition.

Implications for Iteration Round 2

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Figure 12 Heatmap, Iteration Round 2, S.Geissler (2025)

The heatmap analysis provided VIRIDIS with a prioritized portfolio of governance innovations:

Primary candidates: Hybrid Governance Model, Real-Time Dashboards.

Secondary candidates: DAO-inspired participation tools, Stakeholder Councils.

Support mechanisms: Token incentives and Sandbox pilots.

These insights informed the next iteration, where ideas were refined, combined, and tested against Viridis’s strategic, financial, and cultural realities.

### 6.3.3 Iteration Round 2:

Building on the heatmap analysis, the second iteration round focused on refining, combining, and stress-testing the top governance ideas. The goal was to filter out solutions that lacked feasibility while enhancing those with strong potential to bridge VIRIDIS’s governance and investment gaps. Stakeholder workshops and expert consultations provided targeted feedback, ensuring that refinements balanced innovation, practicality, and regulatory alignment.

Refined Governance Solutions

1. Hybrid Governance Model
   * Maintains board-level oversight but integrates token-based stakeholder voting for specific strategic areas such as sustainability projects and investment priorities.
   * Includes tiered decision-making rights: Board retains fiduciary and compliance responsibilities, while stakeholders influence project-level and innovation-related governance.
   * Refinement outcome: Stronger clarity on accountability prevents decision paralysis while signaling inclusivity to investors.
2. Real-Time Transparency Dashboards
   * Expanded scope beyond governance decisions to include financial allocations, ESG metrics, and sustainability impact reporting.
   * Dashboards now integrate EU Taxonomy and CSRD compliance indicators, offering investors real-time evidence of sustainable performance.
   * Refinement outcome: Elevated from an operational tool to a strategic trust-building mechanism for external stakeholders.
3. DAO-Inspired Participation Platform
   * Instead of immediate rollout, the DAO platform will be tested in a “sandbox” pilot with a limited group of employees and project partners.
   * The pilot will experiment with token-based voting, proposal mechanisms, and traceability logs, generating insights for scalability.
   * Refinement outcome: Controlled risk approach ensures learning without destabilizing existing governance.
4. Stakeholder Councils (Refined)
   * Councils restructured to represent direct and indirect stakeholders (employees, investors, project partners, and external advisors).
   * Linked formally to the Hybrid Governance Model, ensuring that council recommendations flow into both executive and decentralized decision layers.
   * Refinement outcome: Transitioned from an informal advisory group to an institutionalized governance body.
5. Tokenized Incentives (Refined as Engagement Booster)
   * Narrowed scope to function as a secondary tool, rewarding active participation in DAO pilot projects and dashboard reporting.
   * Incentives tied to non-financial rewards such as recognition, career development opportunities, and access to strategic decision-making.
   * Refinement outcome: Positioned as a cultural tool rather than a core governance mechanism.

Key Insights from Round 2

* Integration is key: The governance model will not adopt a single solution but combine complementary mechanisms (hybrid structure + dashboards + councils).
* Phased rollout: High-risk innovations (DAO platform) will be tested in pilots, while low-risk/high-value tools (dashboards, councils) can be deployed immediately.
* Regulatory alignment strengthened: Refinements explicitly embed EU sustainable finance frameworks into the design, addressing one of the identified gaps.
* Cultural adaptation required: Token incentives and council participation will be leveraged to shift organizational culture toward co-creation.

## 6.3.4 Iteration Round 3: Final Selection

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Figure 13 Heatmap, Iteration Round 3 S.Geissler (2025)

The third iteration round focused on consolidating the refined ideas into a coherent governance operating model. Based on the results of the heatmap evaluation, refinement workshops, and stakeholder feedback, VIRIDIS identified a balanced portfolio of governance mechanisms that together form the final recommended model. This round emphasized practical integration, ensuring that chosen solutions directly address the gaps identified in this report while aligning with VIRIDIS’s financial, technological, and cultural capacities.

Final Governance Design Components

1. Hybrid Governance Model (Core Structure)
   * Retained as the foundation of the model.
   * Board oversight remains intact, ensuring compliance and fiduciary responsibility.
   * Decentralized participation introduced through token-based voting for specific strategic domains (e.g., sustainability investments, innovation funding).
2. Real-Time Transparency Dashboards (Primary Trust Mechanism)
   * Adopted as a central feature for external visibility.
   * Dashboards integrate financial, ESG, and EU regulatory compliance data, offering verifiable insights for investors and partners.
   * Provides a competitive edge by signaling transparency leadership in the green technology sector.
3. Stakeholder Councils (Institutional Inclusion)
   * Formalized into the governance framework.
   * Councils act as bridges between stakeholders and decision-makers, ensuring recommendations feed into both centralized and decentralized processes.
   * Serves as an onboarding tool for cultural adaptation, preparing stakeholders for deeper DAO-based participation.
4. DAO-Inspired Participation Platform (Pilot Phase)
   * Approved for sandbox implementation, limited to project partners and engaged employees.
   * Functions as an experimental governance tool to test token-based decision-making and gather data on participation rates.
   * Will scale gradually depending on pilot outcomes.
5. Tokenized Incentives (Support Mechanism)
   * Positioned as a secondary engagement tool, rewarding stakeholders who actively participate in DAO pilots and council activities.
   * Helps build a culture of co-creation without over-relying on financialized incentives.

Rationale for Final Selection

* Balance of innovation and feasibility: The hybrid model and dashboards offer immediate value with low implementation risks, while DAO pilots and token incentives allow for innovation at a controlled pace.
* Direct response to GP3 gaps: Structural inclusion, transparency, technological experimentation, and regulatory integration are explicitly addressed.
* Scalability built-in: The modular design ensures that components (e.g., DAO platform) can expand as organizational culture and infrastructure mature.
* Investor appeal: Transparency dashboards and participatory governance mechanisms position Viridis as a first mover in governance innovation, enhancing attractiveness to sustainable finance stakeholders.

Outcome of Iteration Round 3

The outcome is a finalized governance operating model that:

* Retains necessary oversight and compliance mechanisms,
* Embeds participation and transparency at scale,
* Introduces innovation gradually via controlled pilots,
* Aligns with both organizational readiness and external investor expectations.

This consolidated model represents the optimal solution for VIRIDIS, balancing practicality, innovation, and strategic alignment to secure sustainable investment and long-term resilience.

## 6.4 Optimal Innovation Solution

The Optimal Innovation Solution for VIRIDIS is a blended governance operating model that strategically integrates traditional oversight with decentralized participation, transparency mechanisms, and phased technological experimentation. This solution directly responds to the governance and investment gaps identified in earlier research while positioning VIRIDIS as a frontrunner in sustainable governance innovation.

Core Features of the Optimal Solution

1. Hybrid Governance Framework
   * Combines centralized board oversight with decentralized stakeholder participation.
   * Ensures legal and fiduciary compliance while broadening decision-making processes to include employees, investors, and project partners.
   * Provides stability while signaling inclusivity to the investor community.
2. Real-Time Transparency Dashboards
   * Implements dashboards that publish governance decisions, sustainability performance, and financial flows in real-time.
   * Aligns with EU CSRD and Taxonomy requirements, offering verifiable and investor-friendly reporting.
   * Strengthens trust and differentiates Viridis as a leader in governance transparency.
3. Institutionalized Stakeholder Councils
   * Creates formal multi-stakeholder councils that advise and feed into both board-level and decentralized governance structures.
   * Institutionalizes participatory processes while preparing stakeholders for future DAO integration.
4. DAO-Inspired Sandbox Pilot
   * Tests decentralized autonomous organization (DAO) features in a controlled environment, focusing on tokenized decision-making and proposal voting.
   * Generates actionable data on participation, feasibility, and cultural readiness.
   * Provides a safe-to-fail innovation pathway toward larger-scale decentralization.
5. Tokenized Incentives for Engagement
   * Offers non-financially speculative tokens as recognition for participation in councils, DAO pilots, and dashboard reporting.
   * Reinforces cultural change toward co-creation and inclusion without undermining governance integrity.

Strategic Value of the Optimal Solution

* Addresses Solution gaps: Directly mitigates hierarchical inefficiencies, transparency shortcomings, and inclusion barriers.
* Investor appeal: Builds credibility with sustainable finance stakeholders by embedding transparency and participatory governance at the core of operations.
* Balance of risk and innovation: Introduces cutting-edge decentralized governance features without jeopardizing legal and organizational stability.
* Scalable and future-proof: Modular design ensures the model can adapt to Viridis’s growth trajectory, regulatory changes, and evolving technological landscapes.
* Network effect potential: By involving stakeholders in governance, Viridis enhances participation across other green-tech initiatives, reinforcing its ecosystem strategy.

Conclusion

The Optimal Innovation Solution is not a single tool but a governance ecosystem that integrates traditional, decentralized, and experimental mechanisms into a coherent framework. It establishes VIRIDISs as a transparent, inclusive, and future-ready organization, significantly enhancing its ability to attract sustainable investment and expand its influence in the green technology sector.

GP 4 Solution Implimentation START?  
 6.5 DAO Implementation Strategy

The DAO Implementation Strategy for VIRIDIS provides a phased roadmap for embedding decentralized decision-making mechanisms within the existing governance framework. Rather than pursuing full-scale decentralization at once, the approach balances risk management, cultural adaptation, and technological readiness, ensuring that the DAO model strengthens rather than disrupts VIRIDIS’s governance.

Phase 1: Preparation and Capacity Building (Months 1–6)

Stakeholder Education

* + 1. Conduct workshops on decentralized governance principles, blockchain fundamentals, and participatory decision-making.
    2. Develop training modules for employees, investors, and council members to ensure a common baseline of understanding.

Regulatory and Legal Assessment

* + 1. Engage legal experts to ensure DAO elements comply with EU corporate law, CSRD, and SFDR requirements.
    2. Define governance boundaries between DAO-based participation and board-level fiduciary oversight.

Technology Infrastructure Setup

* + 1. Select blockchain platform (e.g., Ethereum layer 2, Polygon, or enterprise-ready alternatives) prioritizing low energy usage and compliance features.
    2. Develop initial smart contracts for proposal submission, voting, and record-keeping.

Phase 2: Sandbox Pilot (Months 7–12)

Pilot Scope:   
1. Limit DAO functions to project-level governance, focusing on sustainability initiatives and innovation funding.  
2. Engage a small group of employees and project partners (~30 participants) to test DAO tools.

Tokenized Participation Mechanism:  
1. Distribute non-speculative governance tokens that allow stakeholders to propose initiatives and vote on project priorities.  
2. Use tokens as proof of participation rather than financial assets, avoiding speculation risks.

Data Collection and Evaluation:  
  
1. Measure participation rates, decision quality, speed of voting, and stakeholder satisfaction.  
2. Compare outcomes to traditional governance processes (baseline KPIs from GP3).

Phase 3: Integration into Hybrid Governance (Year 2)

Expansion of DAO Features:  
  
1. Extend DAO voting rights to a broader set of stakeholders, including investors and external partners.  
2. Enable DAO participants to co-decide on budget allocations for green-tech innovation projects.  
  
Link with Transparency Dashboards:  
  
1. Integrate DAO decision-making outputs into real-time dashboards, providing visible evidence of inclusivity and traceability.  
2. Use dashboards to align DAO activities with EU Taxonomy metrics and CSRD reporting obligations.

Formalization of Councils and DAO Interface:  
  
1. Embed stakeholder councils as intermediaries between DAO participation and board oversight, ensuring both legitimacy and accountability.

Phase 4: Scaling and Institutionalization (Year 3–5)

Broader Stakeholder Engagement:  
  
1. Open DAO participation to indirect stakeholders such as academic partners, NGOs, and community groups, strengthening Viridis’s network effects.  
  
2. Establish mechanisms to prevent dominance by large token holders (e.g., quadratic voting or reputation-based weighting).

Regulatory Alignment and Auditing:

* + 1. Work with auditors and EU regulators to validate DAO governance processes as compliant with sustainable finance standards.
    2. Institutionalize DAO processes into Viridis’s corporate charter or bylaws.

Sustainability and Ecosystem Growth:

* + 1. Position Viridis as a governance innovation leader within the EU Green Deal framework, attracting investors and partners seeking transparent, inclusive models.
    2. Explore cross-company DAO collaborations to align green-tech initiatives across the value chain.

Risk Mitigation in DAO Rollout

* Cultural Resistance → Mitigated through gradual training and incentives.
* Regulatory Uncertainty → Managed via continuous consultation with legal experts and regulators.
* Technological Risks → Minimized by adopting audited smart contracts and energy-efficient platforms.
* Decision Overload → Prevented by limiting DAO scope to strategic projects rather than operational management.

Strategic Impact of DAO Implementation

The DAO implementation positions Viridis as a first mover in governance innovation, directly enhancing:

* Investment attractiveness by signaling transparency and cutting-edge governance.
* Stakeholder trust by offering meaningful participation in decision-making.
* Network expansion through inclusion of indirect stakeholders, strengthening the ecosystem effect.
* Regulatory leadership by aligning with EU sustainability directives while experimenting with next-generation governance.

### 

### 6.5.1 Technical Design (Voting, Token, Dashboard)

The technical design of VIRIDIS’s DAO-enabled governance model is centered on three interconnected components: voting mechanisms, token architecture, and transparency dashboards. Together, these systems form the operational backbone of decentralized participation, ensuring decisions are secure, transparent, and compliant with EU standards.

1. Voting Mechanism

Smart Contract Infrastructure

* + Voting is executed via audited smart contracts deployed on a low-energy blockchain (e.g., Polygon or an enterprise-grade sidechain).
  + Each proposal triggers a smart contract that records votes immutably on-chain.

Voting Models

* + Simple Majority Voting for early pilot decisions to ensure ease of adoption.
  + Quadratic Voting introduced in later phases to prevent dominance by large token holders and balance influence.
  + Weighted Voting for specific cases, where governance tokens are complemented by reputation scores derived from consistent participation.

Security and Auditability

* + Votes are cryptographically signed and stored, providing traceability and non-repudiation.
  + Regular audits ensure contract integrity and regulatory compliance.

2. Token Architecture

Non-Speculative Governance Token

* + Tokens represent participation rights only, not financial value, mitigating speculation risks.
  + Distributed equally among selected stakeholders in the pilot phase, expanding later to broader groups.

Utility Functions

* + Proposal submission rights: tokens required to submit governance proposals.
  + Voting power: tokens enable proportional or quadratic voting, depending on the round.
  + Engagement tracking: active contributors earn additional participation tokens as recognition (non-transferable).

Token Lifecycle:

* + Minting: Tokens generated programmatically at project initiation.
  + Burning: Unused tokens in each governance cycle are burned to reset power imbalances.
  + Reissuance: New tokens distributed periodically to maintain fairness and encourage continuous engagement.

3. Transparency Dashboard

Integration Layer

* + Dashboards connect the DAO voting outputs, financial allocations, and ESG data streams.
  + Built using modular, open-source reporting tools, integrated with blockchain APIs for real-time updates.

Dashboard Features

* + Governance Tracking: Displays active proposals, voting results, and participation rates.
  + Financial Transparency: Links investment decisions to budgets, allocations, and project funding outcomes.
  + Sustainability Metrics: Integrates EU Taxonomy and CSRD indicators (e.g., CO₂ reduction, renewable share of investments).
  + Traceability Logs: Provides public records of governance actions, increasing accountability.

User Experience

* + Intuitive visualizations (heatmaps, timelines, bar charts) designed for accessibility across stakeholder groups.
  + Mobile compatibility ensures broad accessibility, encouraging participation from non-traditional stakeholders.

Technical Safeguards

Privacy by Design: Personally identifiable information anonymized before on-chain storage.

Energy Efficiency: Prioritize eco-friendly blockchain platforms aligned with Viridis’s sustainability mission.  
Scalability: Modular design allows the system to expand from pilot DAO governance to ecosystem-wide participation.

Strategic Contribution

The integration of voting, token, and dashboard systems ensures:

* Credible inclusivity through fair voting mechanisms,
* Accountability via immutable records and transparent dashboards,
* Investor confidence through real-time ESG-aligned reporting,
* Long-term adaptability with scalable and modular technical design.

### 6.5.2 Governance Structure and Rules

The governance structure and rules define how Viridis will integrate DAO mechanisms within its hybrid governance model. The goal is to combine accountability, transparency, and inclusivity while ensuring compliance with legal frameworks and protecting against governance failures.

1. Structural Layers

1. Board of Directors (Oversight Layer)
   * Retains fiduciary and legal accountability under EU corporate law.
   * Maintains veto powers in areas of compliance, risk management, and financial solvency.
   * Oversees the integration of DAO processes into corporate governance.
2. Stakeholder Councils (Advisory & Mediation Layer)
   * Multi-stakeholder groups (employees, investors, NGO partners, academics, indirect stakeholders).
   * Provide input, draft proposals, and serve as a bridge between DAO participants and the board.
   * Ensure balanced representation and prevent capture by single interest groups.
3. DAO Participation Layer (Operational Decision-Making)
   * Token-based voting system enables stakeholders to co-decide on project-level governance, resource allocation, and sustainability initiatives.
   * Scope deliberately limited at first (sandbox approach) and expanded gradually.

2. Governance Rules

Proposal Submission

* + Minimum threshold of participation tokens required to submit proposals.
  + Proposals must be reviewed by councils for compliance with legal and sustainability criteria before being published for voting.

Voting Rights

* + All token holders can participate in votes, with safeguards against concentration of power.
  + Quadratic voting applied to major decisions to balance minority and majority interests.
  + Reputation-based weighting considered for long-term contributors.

Decision-Making Scope

* + DAO initially governs innovation project funding, ESG initiatives, and community engagement activities.
  + Strategic matters (corporate structure, mergers, compliance) remain under board authority.

Transparency & Reporting

* + Every governance cycle (quarterly), results are published on the transparency dashboard.
  + Includes metrics on participation, proposal adoption, funding allocations, and ESG impacts.

Conflict Resolution

* + Stakeholder councils act as the first mediation point.
  + Escalations reviewed by a Governance Audit Committee combining board members and external advisors.

3. Safeguards Against Governance Risks

Preventing Token Concentration: Non-transferable or time-limited tokens reduce risks of accumulation and speculation.

Maintaining Accountability: Board retains veto rights for legal and fiduciary responsibilities.

Avoiding Decision Overload: Clear scope limitations prevent stakeholders from being overwhelmed by excessive proposals.

Regulatory Alignment: Governance rules mapped to EU CSRD, SFDR, and EU Taxonomy requirements to ensure investor confidence.

4. Strategic Benefits

Investor Trust: Clear oversight and structured rules reassure external investors of governance robustness.  
Stakeholder Inclusion: Multi-layered structure ensures diverse voices are heard without undermining compliance.  
Scalability: Rules allow DAO features to expand gradually, avoiding shocks to organizational culture.  
Innovation Leadership: Viridis positions itself as a pioneer in green-tech governance experimentation.

 6.5.3 Roadmap and Phased Rollout

The roadmap for implementing DAO governance at Viridis follows a phased rollout approach, balancing innovation with compliance, cultural adaptation, and technological readiness. Each phase builds progressively on the previous one, ensuring that Viridis minimizes risks while maximizing organizational learning and stakeholder engagement.

Phase 1: Preparation and Design (Months 1–6)

* Governance Alignment: Define DAO governance scope (limited to project-level decisions initially).
* Legal and Regulatory Review: Map DAO activities to EU corporate law, CSRD, SFDR, and EU Taxonomy requirements.
* Capacity Building: Conduct training workshops for staff, managers, and investors on decentralized governance concepts.
* Technology Setup: Select blockchain infrastructure (low-energy, ESG-aligned) and begin development of smart contracts.
* Dashboard Prototype: Develop a minimal viable dashboard to track proposals and voting outcomes.

Phase 2: Pilot Launch (Months 7–12)

* DAO Sandbox: Implement a controlled pilot with ~30 participants (employees, selected investors, project partners).
* Token Distribution: Issue non-transferable participation tokens for proposal submission and voting.
* Voting Process: Test simple majority voting for smaller innovation projects and sustainability initiatives.
* Feedback Loop: Collect data on participation rates, proposal adoption, and user experience.
* Evaluation Report: Compare outcomes against baseline KPIs (decision-making speed, stakeholder engagement).

Phase 3: Expansion and Hybrid Integration (Year 2)

* Council Integration: Formalize stakeholder councils as mediators between DAO processes and board oversight.
* Advanced Voting Models: Introduce quadratic voting to prevent concentration of power.
* Transparency Dashboard Upgrade: Expand dashboard to include financial allocations, ESG metrics, and real-time traceability logs.
* Increased Scope: Extend DAO decision-making to broader project funding allocations, while keeping strategic matters under board authority.
* Investor Engagement: Include external investors and indirect stakeholders in selected DAO processes.

Phase 4: Institutionalization and Scaling (Years 3–5)

* Ecosystem Participation: Open DAO governance to indirect stakeholders (NGOs, academic partners, supply chain actors).
* Cross-Company Collaboration: Explore joint DAO governance structures with other green-tech firms to align innovation ecosystems.
* Regulatory Certification: Work with EU regulators and auditors to validate DAO processes as compliant under sustainable finance rules.
* Governance Charter Update: Integrate DAO rules into Viridis’s corporate charter or bylaws.
* Full Transparency: Link all DAO outputs to sustainability reporting, positioning Viridis as a leader in governance innovation.

A diagram of a process

AI-generated content may be incorrect.

Figure 14 Milestones VIRIDS S.Geissler 2025

**Milestones Overview**

|  |  |  |
| --- | --- | --- |
| **Phase** | **Timeline** | **Key Deliverables** |
| **Phase 1** | **Months 1–6** | **Governance design, legal review, training, smart contract prototypes, dashboard MVP** |
| **Phase 2** | **Months 7–12** | **Pilot DAO launch, token distribution, simple voting system, evaluation report** |
| **Phase 3** | **Year 2** | **Council integration, quadratic voting, upgraded dashboard, investor engagement** |
| **Phase 4** | **Years 3–5** | **Ecosystem participation, regulatory certification, DAO integration into bylaws** |

**Strategic Benefits of the Phased Approach**

* **Risk Management: Small-scale pilots prevent systemic disruption.**
* **Cultural Readiness: Gradual rollout builds acceptance and literacy in decentralized governance.**
* **Investor Confidence: Demonstrates compliance, stability, and innovation in parallel.**
* **Scalability: Modular structure allows expansion across projects and the green-tech ecosystem.**

## 6.6. Implications for VIRIDIS

The implementation of a DAO-based governance model carries strategic, cultural, financial, and operational implications for Viridis. While it introduces new complexities, it also creates pathways for long-term resilience, enhanced stakeholder trust, and stronger positioning in the green-tech investment landscape.

1. Strategic Implications

Positioning as a Governance Innovator  
 By integrating DAO governance, Viridis differentiates itself as an early mover in sustainable finance and governance innovation. This enhances its attractiveness to impact investors and institutional financiers who increasingly prioritize transparency and inclusivity.

Alignment with EU Green Deal Goals  
 The DAO’s traceability and reporting functions directly support Viridis’s compliance with EU sustainable finance regulations (CSRD, SFDR, EU Taxonomy). This positions the firm as a regulatory frontrunner, reducing compliance risks and signaling credibility to external stakeholders.

Ecosystem Network Effects  
 DAO participation broadens the base of stakeholders who contribute to Viridis’s projects, extending influence beyond employees and investors to include NGOs, academics, and communities. This fuels a stronger network effect where collaboration drives innovation and investment inflows.

2. Cultural Implications

Shift Toward Participatory Decision-Making  
 DAO governance requires a cultural transition from hierarchical decision-making to shared authority and inclusivity. Employees and partners must adapt to more transparent, participatory practices.

Stakeholder Empowerment  
 Involving stakeholders directly in project governance enhances trust and engagement. This may improve employee retention, investor loyalty, and partner collaboration.

Resistance and Adoption Challenges  
 Some managers may resist the dilution of traditional authority. Training, communication, and phased rollout will be essential to reduce cultural friction and ensure smooth adoption.

3. Financial Implications

Increased Investment Attractiveness  
 The transparency, traceability, and accountability provided by DAO governance are likely to attract more sustainable finance investment. This strengthens Viridis’s survival prospects and growth opportunities.

Operational Efficiency and Cost Savings  
 Transparent governance processes reduce coordination costs, information asymmetries, and compliance expenses. These efficiencies directly enhance the company’s financial sustainability.

Initial Setup Costs  
DAO implementation requires upfront investment in legal expertise, blockchain infrastructure, and capacity building. While costs are non-trivial, they are offset by medium-term gains in investor confidence and stakeholder engagement.

4. Operational Implications

Governance Structure Redesign  
DAO adoption requires Viridis to formalize new governance layers, including stakeholder councils and a DAO participation mechanism. This necessitates clear role definitions and procedural safeguards.

Integration with Reporting Systems  
DAO decision-making outputs will be integrated into sustainability dashboards, aligning governance actions with EU Taxonomy and ESG performance metrics.  
  
Scalability and Risk Management  
Starting with limited project-level governance ensures risks are contained. Over time, the DAO can scale to broader decision-making domains as organizational maturity increases.

5. Long-Term Implications

Sustainable Competitive Advantage  
Viridis’s hybrid governance model strengthens its brand identity as both a green-tech innovator and governance pioneer, securing long-term investor confidence.

Cross-Industry Leadership  
 The company can export its governance model as a best practice within the EU and beyond, further reinforcing its strategic relevance.

Future-Proofing Governance  
By adopting DAO structures early, Viridis ensures adaptability to future regulatory frameworks and market expectations around transparency and stakeholder participation.

# 7. Validation and Testing

## 7.1 Prototyping (Dashboard, Token Voting Flow)

To validate the DAO governance model before large-scale rollout, Viridis conducted prototyping activities centered on two key components: the transparency dashboard and the token-based voting system. The objective was to test technical feasibility, user experience, and stakeholder engagement, while collecting data for iterative refinement.

1. Prototype Objectives

Demonstrate how decentralized governance can function in practice within Viridis.

Test stakeholder interaction with token-based decision-making.  
  
Assess usability of a dashboard that integrates governance, financial transparency, and ESG metrics.  
  
Generate early feedback loops to inform refinements.

2. Dashboard Prototype

Features Tested

* + Proposal submission and voting results displayed in real time.
  + Governance metrics: participation rates, number of proposals, decision timelines.
  + ESG integration: linking funding decisions with carbon reduction or green-tech KPIs.

Technology Used

* + Built using modular open-source components (e.g., Dune Analytics, Metabase, custom API connections).
  + Blockchain API integration for on-chain vote verification.

Feedback Collected

* + Stakeholders valued visual clarity (graphs, heatmaps, timelines).
  + Concerns raised about data overload; recommendation to simplify user interface for non-technical participants.

3. Token Voting Flow Prototype

Voting Mechanism Tested

* + Simple majority voting used for initial pilot proposals.
  + Token distribution limited to ~30 pilot participants (employees, managers, investors).
  + Tokens were non-transferable to reduce speculation.

Engagement Outcomes

* + Participation rate: ~70% of invited participants cast votes.
  + Average decision time reduced from several weeks (traditional governance) to under 5 days.

User Reactions

* + High trust in transparency of vote counting (immutable records).
  + Some confusion about quadratic voting and token weighting concepts—highlighting need for training in next rollout phase.

4. Iterative Refinements Based on Prototyping

* User Experience Improvements: Simplified dashboard interface and clearer labeling of voting stages.
* Governance Adjustments: Added proposal submission guidelines to ensure relevance and avoid “proposal flooding.”
* Education Efforts: Designed training sessions on token mechanics and decentralized decision-making.

5. Validation Outcomes

* Prototyping confirmed the technical feasibility of DAO governance at Viridis.
* Stakeholders demonstrated strong willingness to participate, supporting research question 2 (inclusion increases active participation).
* Early results suggest DAO tools can enhance decision-making speed, transparency, and investment attractiveness.
* Identified challenges (complexity, cultural adaptation) provide clear focus for further refinement.

## 7.2 Pilot Workshops and Feedback Loops

Pilot workshops were conducted to test Viridis’s DAO governance concept in a real-world, participatory setting. The goal was to assess how employees, managers, investors, and external partners would engage with token-based governance and whether these mechanisms improved inclusion, transparency, and decision-making efficiency.

1. Workshop Objectives

Familiarize stakeholders with DAO principles, token voting, and the transparency dashboard.  
  
Simulate governance processes using pilot proposals on project funding and ESG initiatives.  
  
Collect qualitative and quantitative feedback on usability, trust, and perceived fairness.  
  
Validate whether DAO participation encourages wider stakeholder involvement in Viridis’s ecosystem.

2. Workshop Design

Participants: ~30 individuals, including employees, middle managers, select investors, and academic partners.

Structure:

* + Introduction to DAO and decentralized decision-making.
  + Demonstration of the dashboard and voting process.
  + Group exercise: submission of sample proposals, followed by voting and results review.
  + Feedback session using surveys and moderated discussion.

Proposals Tested:

* + Allocation of funds for green-tech R&D pilot projects.
  + Stakeholder-driven sustainability initiative (e.g., carbon tracking).

3. Feedback Collection Methods

Surveys: Measured ease of use, perceived fairness, trust in results, and willingness to use DAO in future projects.

Focus Groups: Captured deeper reflections on cultural barriers, transparency, and learning curves.

Observation Metrics: Tracked proposal engagement rates, decision speed, and number of participants contributing beyond voting.

4. Key Feedback Insights

Positive Outcomes:

* + 80% of participants reported higher trust in the process compared to traditional governance.
  + 70% valued the speed of decision-making (average of 5 days vs. weeks in traditional setup).
  + Strong perception that DAO governance enhances stakeholder empowerment and inclusion.

Challenges Identified:

* + Non-technical participants found token mechanics confusing.
  + Concerns raised about decision overload if too many proposals are introduced at once.
  + Managers noted possible risks of diluting accountability if DAO rules are not well-defined.

5. Feedback Loops and Refinements

Iteration 1: Simplified voting interface with clear stages (proposal, discussion, voting, result).

Iteration 2: Introduced training modules on DAO mechanics for non-technical users.

Iteration 3: Added proposal submission filters to ensure relevance and quality.

Ongoing: Quarterly pilot workshops planned to expand user groups (including NGOs, supply chain partners) and refine governance rules.

6. Validation Against Research Questions

Research Question 1: DAO pilot demonstrated increased participation rates, confirming its potential to outperform hierarchical governance.  
  
Research Question 2: Workshop data shows that inclusion in DAO processes encouraged broader engagement in related Viridis initiatives, supporting the network effect hypothesis.  
  
Research Question 3: Early feedback suggested that stakeholders favored directing DAO funding toward green-tech innovation, aligning governance with sustainability goals.

## 7.3 Validation with Direct Stakeholders

Direct stakeholder validation was a critical step in assessing whether DAO-based governance could meet Viridis’s needs for inclusivity, transparency, and investment attractiveness. This phase focused on employees, managers, and investors, the actors most immediately affected by changes to decision-making structures.

1. Stakeholder Groups Engaged

Employees: Representing operational staff across project teams.  
Middle and Senior Managers: Responsible for oversight, resource allocation, and reporting.  
Investors and Financial Partners: Including both impact investors and traditional financiers.

2. Validation Activities

Interviews: Semi-structured interviews conducted with 10 employees, 5 managers, and 3 investors.  
Surveys: Distributed to 25 staff participants, measuring attitudes toward DAO adoption, transparency, and inclusiveness.  
Live Demonstrations: Walkthrough of the prototype dashboard and token voting flow.

3. Key Findings

Employees

* Reported higher trust in the decision-making process due to transparency of vote results.
* Expressed enthusiasm for having an equal voice, with 75% stating they would be more likely to contribute ideas in a DAO structure.
* Concerns centered on technical literacy—some employees worried about misunderstanding token mechanics.

Managers

* Recognized the efficiency benefits of DAO processes (reduced decision time from weeks to days).
* Expressed cautious support but stressed the need for clear boundaries between DAO and board-level authority.
* Highlighted potential risks of “decision overload” and stressed importance of proposal quality filters.

Investors

* Viewed DAO implementation as a signal of governance innovation and sustainability alignment.
* Considered traceability features highly valuable for ESG reporting, increasing confidence in Viridis’s future financing rounds.
* Requested assurance that DAO processes would remain compliant with EU corporate law and financial regulations.

4. Impact on Research Questions

* RQ1 (Decentralized vs. Traditional Governance): Validation showed increased participation and faster decision-making, confirming advantages over hierarchical structures.
* RQ2 (Network Effect of Inclusion): Employees and managers indicated stronger willingness to engage in Viridis projects when included in governance decisions, supporting the hypothesis of enhanced participation.
* RQ3 (Green-Tech Orientation): Both employees and investors leaned toward prioritizing green-tech funding within DAO proposals, suggesting that inclusion reinforces sustainability-aligned innovation.

5. Refinements from Direct Stakeholder Feedback

* Development of DAO literacy training programs to address technical concerns.
* Implementation of proposal submission guidelines to ensure strategic alignment and prevent overload.
* Integration of legal audit checkpoints to ensure compliance with EU financial and governance regulations.

## 7.4 Validation with Indirect Stakeholders and Non-Users

Validation with indirect stakeholders and non-users was essential to assess how Viridis’s DAO governance model would be perceived by external actors who may not directly participate in daily decision-making but nonetheless influence or are influenced by VIRIDIS’s operations. This group included NGOs, policymakers, academic experts, supply chain partners, and community representatives.

1. Stakeholder Groups Engaged

* NGOs and Civil Society: Environmental and social organizations with an interest in sustainable investment practices.
* Policymakers and Regulators: EU-level policy advisors and sustainability governance specialists.
* Academic Experts: Researchers in blockchain governance, sustainable finance, and organizational design.
* Supply Chain Partners: Companies providing services or technologies to Viridis.
* Community Representatives: Local actors impacted by Viridis’s sustainability initiatives.

2. Validation Activities

* Roundtable Discussions: Two workshops held with NGO and academic representatives, focusing on inclusivity, sustainability, and potential risks of DAO governance.
* Policy Consultations: Informal interviews with EU sustainability advisors to gauge regulatory alignment.
* Surveys: Distributed to 20 external stakeholders measuring perceived legitimacy, trustworthiness, and risks.
* Scenario Testing: Participants reviewed sample DAO proposals to evaluate transparency, accountability, and decision traceability.

3. Key Findings

NGOs and Civil Society

* Valued the democratization of decision-making and enhanced inclusivity.
* Emphasized need for safeguards against token concentration by powerful actors.
* Recommended integration of social impact metrics in governance dashboards.

Policymakers and Regulators

* Highlighted the DAO’s alignment with EU Green Deal and CSRD reporting requirements, especially through traceability and transparency.
* Requested clear compliance frameworks to avoid regulatory uncertainty.

Academic Experts

* Strongly supported DAO experimentation as a living lab for governance innovation.
* Suggested continued empirical testing to measure network effects and stakeholder participation rates.

Supply Chain Partners

* Interested in DAO mechanisms as a way to increase collaboration and trust across the ecosystem.
* Raised questions about interoperability with existing governance structures and contracts.

Community Representatives

* Expressed cautious optimism, noting that inclusivity must extend beyond technical experts to ensure real accessibility.

4. Impact on Research Questions

* RQ1 (Decentralized vs. Traditional Governance): Indirect stakeholders validated the increased transparency and accountability of DAO governance as superior to hierarchical models.
* RQ2 (Network Effect of Inclusion): NGOs and partners confirmed that broader inclusion could attract new collaborations and partnerships, strengthening the ecosystem-wide network effect.
* RQ3 (Green-Tech Orientation): Validation confirmed that DAO proposals with sustainability goals are more likely to gain support from external stakeholders, aligning governance with green-tech investment priorities.

5. Refinements from Indirect Stakeholder Feedback

* Development of anti-concentration mechanisms (e.g., capped token voting power).
* Integration of impact-oriented KPIs into dashboards (social and environmental outcomes).
* Creation of regulatory compliance documentation to reassure investors and policymakers.
* Expansion of training and outreach programs to ensure accessibility for non-technical community actors.

## 7.5 Positive and Negative Side Effects

The validation and testing of VIRIDIS’s DAO-based governance model revealed a range of positive and negative side effects that go beyond the immediate outcomes of faster decision-making and higher participation. Identifying these effects is crucial for refining the implementation strategy, managing risks, and strengthening the long-term business case.

Positive Side Effects

1. Increased Trust and Legitimacy
   * Stakeholders reported higher confidence in decisions due to transparent voting and immutable records.
   * Investors considered the DAO a signal of good governance, boosting Viridis’s credibility in sustainable finance markets.
2. Enhanced Participation and Inclusion
   * Employees felt empowered by having a direct voice in governance.
   * Broader stakeholder inclusion reinforced network effects, attracting external partners and NGOs.
3. Faster and More Efficient Decision-Making
   * Average decision cycles reduced from weeks to just a few days.
   * Allowed Viridis to respond more quickly to emerging sustainability opportunities and regulatory changes.
4. Alignment with ESG and Green Tech Goals
   * Funding and resource allocation decisions increasingly reflected sustainability priorities.
   * Demonstrated strong alignment with EU Green Deal and CSRD requirements, improving long-term compliance positioning.
5. Innovation Spillovers
   * The DAO prototype functioned as a living lab, creating insights transferable to other governance and sustainability experiments.
   * Positioned Viridis as a pioneer in governance innovation within the green-tech sector.

Negative Side Effects

1. Complexity and Technical Barriers
   * Non-technical participants struggled with token mechanics and dashboard features.
   * Risk of exclusion by complexity, especially for employees without digital literacy.
2. Risk of Decision Overload
   * Concerns arose about “proposal flooding” if too many initiatives were submitted without filters.
   * Could reduce decision quality and dilute strategic focus.
3. Potential Power Concentration
   * Token distribution risks were flagged, with fears that larger stakeholders could dominate voting.
   * Requires safeguards such as quadratic voting or capped influence.
4. Accountability Ambiguities
   * Managers warned of blurred lines between DAO decisions and executive oversight.
   * Risk of undermining clear responsibility for strategic outcomes.
5. Regulatory Uncertainty
   * Policymakers highlighted gaps between DAO governance practices and existing corporate law.
   * Without legal clarity, DAO adoption could raise compliance risks for Viridis.

Key Takeaway

The DAO governance model clearly produces positive systemic effects—trust, speed, participation, and ESG alignment—that strengthen Viridis’s strategic positioning. However, negative side effects such as complexity, accountability risks, and regulatory uncertainty must be carefully managed. Addressing these risks through training, proposal filters, governance safeguards, and compliance audits will be critical for successful scaling.

## 7.6 Iteration Outcomes

The iterative testing and validation of the DAO governance model for Viridis followed a structured, multi-cycle approach that progressively refined the solution. Each iteration built upon feedback from stakeholders, addressing both technical and organizational challenges while aligning outcomes with the research questions.

Iteration 1: Initial Pilot and Concept Testing

Focus: Test the feasibility of token voting and dashboard transparency.

Findings:

* + High enthusiasm from employees and investors for transparency and inclusion.
  + Confusion among non-technical participants regarding token mechanics.
  + Concerns from managers about overlap with existing governance responsibilities.

Refinements Introduced: Simplified voting process with clear step-by-step stages; training modules proposed.

Iteration 2: Refinement through Workshops and Feedback Loops

Focus: Test engagement levels, proposal quality, and decision efficiency.

Findings:

* + 70% of participants reported faster decision-making.
  + NGOs and external stakeholders emphasized risks of token concentration and demanded safeguards.
  + Participants requested filters for proposal submission to avoid overload.

Refinements Introduced: Implementation of quadratic voting simulations, proposal quality checks, and community onboarding workshops.

Iteration 3: Broadening Stakeholder Validation

Focus: Involve indirect stakeholders (NGOs, regulators, academic experts, community representatives).

Findings:

* + Policymakers confirmed alignment with EU sustainability regulations but flagged compliance uncertainties.
  + Academic experts supported the DAO as a governance innovation “living lab.”
  + Supply chain partners showed interest in DAO collaboration but sought interoperability guarantees.

Refinements Introduced: Integration of impact metrics in dashboards, regulatory compliance checkpoints, and anti-concentration mechanisms.

Iteration 4: Consolidated Testing and Scenario Validation

Focus: Validate the DAO in simulated real-case scenarios (fund allocation for R&D and ESG initiatives).  
  
Findings:

* + Clear preference for green-tech prioritization in proposals.
  + Stronger network effects observed as employees and partners expressed intent to engage in other Viridis projects.
  + Emergence of accountability concerns, who holds responsibility for DAO-approved outcomes?

Refinements Introduced: Establishment of dual-layer governance model (DAO-driven participatory decisions + executive oversight for accountability).

Overall Outcomes

* Improved Transparency and Trust: Across all iterations, stakeholders consistently valued transparency and traceability.
* Broader Participation and Inclusion: Employee and partner involvement increased with each iteration, reinforcing the network effect hypothesis.
* Green-Tech Orientation Strengthened: Proposals and funding priorities leaned toward sustainability-focused projects.
* Refined Governance Framework: A hybrid governance model emerged as the most viable outcome, balancing decentralized participation with structured accountability.

# 8. Multi-Value Business Case

## 8.1 Financial Analysis

The financial analysis evaluates the feasibility of implementing a DAO-based governance model for VIRIDIS, focusing on costs, savings, and potential revenue streams. The aim is to determine whether decentralized governance strengthens Viridis’s ability to attract green-tech investment while ensuring long-term financial sustainability.

1. Initial Setup Costs (CAPEX)

The capital expenditures associated with DAO implementation include:

* Platform Development and Customization: €80,000 – includes dashboard design, smart contract integration, and token mechanism.
* Legal and Compliance Structuring: €25,000 – consultations for alignment with EU corporate law, CSRD, and SFDR.
* Training and Change Management: €15,000 – DAO literacy workshops and onboarding programs for employees and partners.
* Infrastructure (Servers, Cloud, Security Audits): €30,000 – covering blockchain nodes, cybersecurity reviews, and integration with existing IT systems.

Total CAPEX Estimate: ~€150,000

2. Operational Expenses (OPEX)

Ongoing costs for maintaining DAO governance include:

* Platform Maintenance and Updates: €40,000 annually.
* Compliance Monitoring and Audits: €15,000 annually.
* Facilitation of Governance Processes: €10,000 annually for moderation and proposal vetting.
* Community Engagement and Outreach: €20,000 annually.

Total OPEX Estimate: ~€85,000 annually

3. Revenue and Cost Savings

a) Cost Savings

Reduced Transaction and Bureaucracy Costs: Faster and transparent decision-making reduces administrative overhead by ~15%, translating to €50,000 savings annually.  
  
Lower Investor Due Diligence Costs: Transparent governance reduces reporting burdens, saving ~€20,000 annually.

b) New Revenue Streams

Increased Access to Sustainable Finance: DAO governance improves ESG credibility, enabling access to EU green finance programs and impact investment funds, estimated at €500,000–€1,000,000 over three years.  
  
V-GTI (Viridis Green-Tech Investment): Crowdfunding-style participation via tokenized governance could generate new inflows of ~€200,000 annually from community investors.  
  
V-ECO (Viridis Ecosystem Services): Offering DAO-enabled governance as a service to partners may create additional income streams of ~€100,000 annually.

4. Financial Model and Payback Period

Year 1: High CAPEX burden (~€150,000) plus OPEX (€85,000). Partial offset through €200,000 investor inflows.  
  
Year 2: Net inflows from sustainable finance (~€300,000–€400,000) outweigh ongoing OPEX.  
  
Year 3: Full payback achieved, with net positive returns estimated at ~€250,000–€400,000 annually.

Payback Period: 2–2.5 years

5. Key Financial Insights

DAO implementation is financially viable within a medium-term horizon, with break-even achieved by Year 3.

The primary value creation lies in access to larger pools of sustainable finance and improved investor confidence.  
  
Long-term benefits include lower compliance costs, faster capital allocation, and diversification of revenue streams through ecosystem services.

### 8.1.1 Initial Setup Costs (CAPEX)

The initial capital expenditures (CAPEX) required to implement the DAO-based governance model at Viridis represent the foundation for technological, legal, and organizational transformation. These costs are primarily front-loaded in Year 1 and are essential to establish a functional, compliant, and inclusive governance platform.

1. Platform Development and Customization   
 €80,000

* Development of a blockchain-enabled governance dashboard with token voting functionality.
* Integration of smart contracts for proposal submission, decision-making, and transparent record-keeping.
* Customization to ensure alignment with Viridis’s sustainability strategy and user accessibility needs.

2. Legal and Compliance Structuring

*€*25,000

* Legal review and consultation to align DAO operations with EU corporate law, CSRD, SFDR, and EU Taxonomy requirements.
* Drafting of DAO governance rules, terms of participation, and safeguards against misuse.
* Engagement with regulatory advisors to mitigate risks associated with DAO legal recognition.

1. Training and Change Management

€15,000

* DAO literacy workshops for employees, managers, and stakeholders to overcome adoption barriers.
* Creation of educational materials, simulation exercises, and onboarding guides.
* Change management support to address cultural shifts from hierarchical to participatory governance.

1. Infrastructure and Security

€30,000

* Setup of secure IT infrastructure, including blockchain nodes, cloud hosting, and integration with Viridis’s existing systems.
* Implementation of cybersecurity audits and penetration testing to protect DAO assets.
* Establishment of data privacy protocols in line with GDPR and EU digital governance frameworks.

Total estimated CAPEX:

€150,000

This upfront investment is substantial but necessary to ensure a robust, legally compliant, and trusted DAO implementation. Importantly, it positions VIRIDIS to unlock access to green finance opportunities and establish itself as a pioneer in governance innovation within the green-tech industry.

### 8.1.2 Operational Costs (OPEX)

The operational expenses (OPEX) of implementing and running a DAO-based governance model for Viridis consist of recurring costs required to ensure the system remains functional, secure, and engaging for stakeholders. Unlike CAPEX, which is front-loaded, OPEX represents the sustained financial commitment to support long-term governance and participation.

1. Platform Maintenance and Updates – €40,000 annually

Ongoing technical maintenance of the DAO dashboard, token voting mechanisms, and blockchain infrastructure is required to ensure uptime, usability, and trust. Such recurring costs are a hallmark of blockchain-based governance structures, which demand constant updates for security and usability (Glaser, 2021).

2. Compliance Monitoring and Audits – *€15,000 annually*

DAO governance must remain aligned with EU regulations such as CSRD, SFDR, and the EU Taxonomy. Continuous third-party audits are critical to maintain compliance and investor trust, reflecting broader findings that compliance alignment improves ESG finance access (European Commission, 2020; Flammer, 2021).

3. Governance Facilitation and Moderation – *€10,000 annually*

Moderation of proposals and facilitation of engagement sessions helps prevent overload and ensures fair participation. Prior research indicates that decentralized systems require structured facilitation to avoid governance inefficiencies (Beck, Müller-Bloch, & King, 2018).

4. Community Engagement and Outreach – *€20,000 annually*

Sustained participation depends on outreach and communication. Continuous engagement ensures that stakeholders perceive value in the system and remain active, which research identifies as a key success factor for decentralized models (Hsieh, Vergne, & Wang, 2018).

Total Estimated OPEX: €85,000 annually

These costs ensure continuity, inclusivity, and compliance, while reducing the risks of participant disengagement or regulatory misalignment.

Key Insights

* OPEX ensures the DAO’s continuity, inclusivity, and compliance, avoiding risks of participant disengagement or regulatory misalignment.
* The relatively moderate recurring costs are offset by efficiency gains (e.g., reduced administrative overhead) and revenue opportunities (access to sustainable finance, new services).
* Over time, OPEX can be partly absorbed into Viridis’s ecosystem revenues (V-GTI, V-ECO), making governance self-sustaining.

### 8.1.3 Cost Savings and Efficiency Gains

The implementation of a DAO-based governance system at Viridis delivers not only operational improvements but also measurable cost savings and efficiency gains. These gains stem from automation, transparency, reduced compliance risks, and the network effects of broader stakeholder participation.

1. Reduced Administrative Overhead – *~€50,000 annually*

Traditional governance structures rely on multiple layers of approval, manual reporting, and time-intensive coordination. By contrast, DAO-enabled decision-making automates these processes through smart contracts and blockchain-based record-keeping. This reduces governance-related labor costs by an estimated 15%, saving Viridis approximately €50,000 annually (Beck, Müller-Bloch, & King, 2018).

2. Lower Due Diligence and Reporting Costs – *~€20,000 annually*

Investors and regulators require detailed documentation for compliance verification. DAO systems generate immutable, real-time governance records that can be accessed directly, thereby reducing the time and costs associated with audits and reporting. Studies in sustainable finance confirm that greater transparency decreases due diligence costs and accelerates investment readiness (Flammer, 2021; European Commission, 2020).

3. Streamlined Capital Allocation – *Decision time reduced by 60–70%*

In hierarchical models, capital allocation is slowed by sequential approvals. DAO voting and smart contracts enable faster, more transparent deployment of resources. This reduces decision times by up to 70%, increasing Viridis’s agility in launching green-tech projects, an advantage that is especially valuable in fast-moving investment landscapes (Glaser, 2021).

4. Risk Reduction in Compliance and Governance Failures – *Avoided costs ~€30,000–€50,000 annually*

Traditional governance exposes firms to risks of regulatory penalties, internal disputes, and reputational damage due to opaque processes. DAOs mitigate these risks by embedding transparency, accountability, and auditability directly into governance workflows. This lowers the likelihood of fines or investor mistrust, translating into avoided costs estimated between €30,000 and €50,000 annually (Hsieh, Vergne, & Wang, 2018).

5. Network Effect and Ecosystem Efficiency

By involving a wider set of stakeholders, DAO governance fosters stronger collaboration, resource pooling, and shared accountability. Such inclusiveness reduces coordination costs and enhances legitimacy, amplifying Viridis’s position within the green-tech ecosystem. Research shows that decentralized structures can leverage participation to achieve systemic efficiency gains beyond direct financial savings (De Filippi & Wright, 2018).

Total Estimated Annual Cost Savings:

€100,000–€120,000 per year

These savings significantly offset the annual operational costs of approximately €85,000. As such, once the DAO is implemented, Viridis can expect the governance system to become financially self-sustaining, while simultaneously reinforcing stakeholder trust and long-term competitive advantage.

## 8.2 Revenue Streams

A critical element of the DAO governance model for Viridis is its ability to not only reduce costs but also generate new revenue streams through its ecosystem platforms. Two primary channels, V-GTI (Viridis Green Tech Investment) and V-ECO (Viridis Ecosystem Services), provide distinct but complementary opportunities for revenue growth.

### 8.2.1 V-GTI Revenue Generation

The Viridis Green Tech Investment (V-GTI) platform leverages the DAO structure to create transparent and inclusive investment processes. By offering a decentralized investment gateway, V-GTI increases trust among institutional and retail investors while lowering transaction costs associated with traditional investment models.

1. Transaction Fees and Service Charges
   * Every investment transaction through V-GTI incurs a small fee, generating recurring income for VIRIDIS.
   * Comparable models in decentralized finance have shown transaction-based revenue to be sustainable and scalable (De Filippi & Wright, 2018).
2. Co-Investment Opportunities
   * The transparent voting system incentivizes co-investments by external partners, thereby attracting new capital inflows into Viridis-led projects.
   * Research shows that decentralized systems improve investment attractiveness by lowering due diligence barriers (Flammer, 2021).
3. Market Differentiation and Premium Services
   * V-GTI’s blockchain-based compliance and ESG alignment create a unique market position, enabling Viridis to offer premium services such as real-time sustainability tracking.
   * Investors are increasingly willing to pay for verified ESG compliance (European Commission, 2020).

### 8.2.2 V-ECO Revenue Generation

The VIRIDIS Ecosystem (V-ECO) builds value by providing services and coordination mechanisms across green-tech stakeholders, ranging from suppliers to NGOs.

1. Subscription and Membership Fees
   * V-ECO participants (e.g., SMEs, NGOs, and investors) can subscribe to governance participation, access dashboards, and join collaborative initiatives.
   * Membership-based models in decentralized platforms have been effective in financing ongoing ecosystem operations (Beck, Müller-Bloch, & King, 2018).
2. Data and Analytics Services
   * The DAO generates governance and project data, which can be anonymized and monetized as insights for policymakers, academics, and investors.
   * Decentralized marketplaces for trusted data have shown potential for creating additional revenue streams (Glaser, 2021).
3. Value-Added Services
   * V-ECO can expand into consultancy, training programs, and ESG certification services, supported by its transparent governance model.
   * Evidence suggests that such services can become stable income sources when aligned with sustainability transitions (European Commission, 2020).

Key Takeaway

V-GTI focuses on investment-driven revenues, while V-ECO emphasizes ecosystem and service-based revenues. Together, they reinforce Viridis’s sustainability mission while ensuring that governance innovation is tied to financial viability. This dual-channel revenue strategy aligns with trends in both decentralized governance and sustainable finance, positioning VIRIDIS as a competitive leader in green-tech investment ecosystems.

## 8.3 Financial Model and Payback Period

The financial viability of the DAO-based governance system for Viridis depends on balancing the initial CAPEX, ongoing OPEX, and the revenues and savings generated through V-GTI, V-ECO, and efficiency gains. A structured financial model allows the calculation of the payback period, which is a critical indicator for both internal management and external investors.

1. Initial Investment (CAPEX)

One-time setup costs (platform development, legal compliance, infrastructure, training): €150,000 (see section 8.1.1).

2. Annual Operational Expenses (OPEX)

Maintenance, compliance monitoring, governance facilitation, and engagement: €85,000 annually (see section 8.1.2).

3. Annual Cost Savings and Efficiency Gains

Reduced administrative overhead, compliance risk reduction, and network effects: €100,000–€120,000 annually (see section 8.1.3)

4. Annual Revenue Streams

V-GTI (investment platform): Transaction fees, co-investment incentives, and premium ESG services: €60,000–€80,000 annually.  
  
V-ECO (ecosystem services): Membership fees, analytics services, consultancy, and training: €40,000–€60,000 annually.

Total New Revenues: €100,000–€140,000 annually.

5. Combined Net Annual Benefit

Total Positive Impact (Savings + Revenues): €200,000–€260,000 annually.

Less OPEX: €85,000 annually.

Net Annual Benefit: €115,000–€175,000 annually.

6. Payback Period

With CAPEX = €150,000 and Net Annual Benefit = €115,000–€175,000, the payback period is achieved within 1–1.5 years.

This rapid payback strengthens the case for DAO adoption, showing that governance innovation can be not only sustainable but also financially profitable in the short term.

7. Strategic Implications

Short-term (Year 1–2): Break-even point reached quickly, reducing financial risk for Viridis.

Medium-term (Year 3–5): Accumulated benefits create a strong competitive edge and new capital attraction.

Long-term (Beyond Year 5): DAO governance becomes a self-sustaining model with compounding financial and reputational gains, aligning VIRIDIS with EU Green Deal finance priorities (European Commission, 2020; Flammer, 2021).  
  
 8.4 Scenario Analysis

Scenario analysis provides a structured way to assess VIRIDIS’s financial resilience under varying conditions. By testing best-case, normal-case, and worst-case assumptions, the analysis illustrates how the DAO governance model performs under different market, participation, and regulatory environments. More details can be found in the appendix under section A.3 Risk & Opportunities and Financial and Investment Barriers and Scenarios in detail.

A screenshot of a computer screen

AI-generated content may be incorrect.

Figure 15 Scenarios S.Geissler 2025

4. Comparative Overview

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Scenario | Revenues (€) | Cost Savings (€) | Net Annual Benefit (€) | Payback Period | Strategic Implication |
| Best Case | 140,000–160,000 | 120,000 | 175,000–195,000 | < 1 year | Market leader, scale globally |
| Normal Case | 100,000–120,000 | 100,000 | 115,000–135,000 | 1–1.5 years | Stable governance base |
| Worst Case | 60,000–80,000 | 80,000 | 55,000–75,000 | 2–3 years | Slower adoption, still viable |

Strategic Takeaway

The scenario analysis demonstrates that across all conditions, the DAO model for VIRIDIS is financially sustainable. In the best-case, it delivers rapid growth and leadership in sustainable governance. In the normal-case, it achieves a fast payback with steady resilience. Even in the worst-case, the model remains viable with an extended but acceptable payback, proving that decentralized governance enhances both financial and strategic resilience (Beck, Müller-Bloch, & King, 2018; Glaser, 2021).

### 8.4.1 Best Case

The best-case scenario assumes that VIRIDIS’s DAO governance model achieves high adoption and rapid market recognition within the first two years. Strong participation from stakeholders, supportive EU policy frameworks, and early demonstration of transparency and efficiency drive this outcome.

Key Assumptions

* Stakeholder participation exceeds 70%, including both internal employees and external partners.
* V-GTI attracts significant investor interest, resulting in rapid capital inflows.
* V-ECO ecosystem services (membership, consultancy, data analytics) are fully subscribed in the first two years.
* EU Green Deal and sustainable finance regulations create favorable policy conditions, including subsidies and incentives for green investment (European Commission, 2020).
* DAO governance builds a strong reputation for trust and compliance, accelerating network effects.

Financial Outcomes

* Annual Revenues: €140,000–€160,000.
* Annual Cost Savings: €120,000 (efficiency, transparency, and reduced administrative overhead).
* Net Annual Benefit after OPEX: €175,000–€195,000.
* Payback Period: Less than 1 year.

Strategic Implications

* VIRIDIS becomes a market leader in decentralized governance for green-tech investment.
* Enhanced transparency and efficiency attract institutional investors, creating a reinforcing cycle of trust and capital inflow (Flammer, 2021).
* Strong ecosystem engagement positions Viridis as a benchmark case in EU sustainable finance, enabling international scaling opportunities.
* The rapid break-even point frees resources for reinvestment into new green-tech initiatives, compounding long-term value.

### 8.4.2 Normal Case

The normal-case scenario reflects a balanced and realistic outcome where Viridis’s DAO governance model achieves moderate adoption and steady growth. Participation is solid but not universal, revenues from V-GTI and V-ECO grow at a predictable pace, and cost savings are realized but not maximized. This scenario represents the most likely trajectory if adoption progresses without major disruptions or accelerations.

Key Assumptions

* Stakeholder participation reaches 40–60% within the first two years.
* V-GTI attracts a consistent flow of investment but faces competition from traditional platforms.
* V-ECO services achieve moderate uptake, with membership and consultancy growing steadily.
* Efficiency gains are realized primarily through reduced administrative burden and improved compliance reporting.
* EU sustainable finance regulations remain stable, with moderate support for decentralized governance innovations (European Commission, 2020).

Financial Outcomes

* Annual Revenues: €100,000–€120,000.
* Annual Cost Savings: €100,000.
* Net Annual Benefit after OPEX: €115,000–€135,000.
* Payback Period: 1–1.5 years.

Strategic Implications

* VIRIDIS establishes a stable governance foundation, proving the viability of the DAO model without overexposure to risks.
* Moderate financial returns still allow for reinvestment in innovation, albeit at a slower pace than in the best-case scenario.
* VIRIDIS strengthens its market credibility as an innovator in sustainable governance but does not yet dominate the field.
* The DAO model demonstrates resilience and incremental value creation, aligning with trends in governance innovation (Beck, Müller-Bloch, & King, 2018; Glaser, 2021).

### 8.4.3 Worst Case

The worst-case scenario envisions conditions where adoption of VIRIDIS’s DAO governance system is slow, stakeholder engagement is limited, and revenue growth from V-GTI and V-ECO falls below expectations. Additional compliance costs, stakeholder resistance, or technological barriers increase OPEX, while the benefits of decentralization are not fully realized. Despite these setbacks, the model remains financially viable, though with a significantly longer payback period.

Key Assumptions

* Stakeholder participation remains below 30%, limiting network effects and governance inclusivity.
* V-GTI struggles to attract large investors, with transaction volumes lower than expected.
* V-ECO services gain only minimal traction due to ecosystem hesitation and lack of perceived immediate value.
* Compliance and technology integration costs are higher than planned, raising annual OPEX.
* Market and regulatory conditions tighten, creating additional reporting obligations (European Commission, 2020).

Financial Outcomes

* Annual Revenues: €60,000–€80,000.
* Annual Cost Savings: €80,000.
* Net Annual Benefit after OPEX: €55,000–€75,000.
* Payback Period: 2–3 years.

Strategic Implications

* VIRIDIS faces slower adoption, requiring extended engagement campaigns to build trust among stakeholders.
* The DAO model delivers incremental benefits but fails to achieve transformative change in the short term.
* The extended payback period poses challenges for investor confidence, though the model’s long-term potential remains intact.
* VIRIDIS must leverage pilot projects and small-scale case studies to demonstrate value, gradually overcoming resistance and building momentum (Beck, Müller-Bloch, & King, 2018; Glaser, 2021).
* Even in this conservative scenario, VIRIDISavoids financial losses and maintains a positive return, showing that the DAO model is low-risk, high-potential in the long run.

## 8.5 Competitive Industry Positioning

VIRIDIS’s adoption of a DAO-based governance model positions it uniquely in the green-tech investment landscape. While many competitors in sustainable finance rely on traditional governance models or incremental digital innovations, Viridis differentiates itself through full decentralization, transparency, and stakeholder inclusion. This creates both a competitive advantage and a strong alignment with broader regulatory and market trends.

1. Comparative Advantage

* Transparency & Trust: By embedding decision-making on a blockchain infrastructure, Viridis ensures immutable records of participation and voting. This significantly strengthens trust among investors, NGOs, and regulators compared to traditional hierarchical models (De Filippi & Wright, 2018).
* Stakeholder Engagement: DAO governance promotes active involvement of employees, partners, and investors, fostering stronger network effects than competitors with closed decision-making structures (Glaser, 2021).
* Sustainability Alignment: The EU Green Deal and SFDR (Sustainable Finance Disclosure Regulation) encourage transparency and sustainable governance frameworks (European Commission, 2020). Viridis’s model pre-empts these requirements, giving it a first-mover advantage in compliance readiness.

2. Industry Benchmarking

* Traditional Competitors: Large asset managers and corporate investors maintain hierarchical decision-making, often criticized for being opaque and slow to adapt (Beck, Müller-Bloch, & King, 2018).
* Emerging Players: Startups experimenting with blockchain-based finance typically emphasize efficiency or DeFi tools, but rarely integrate sustainability and governance into their models.
* VIRIDIS’s Position: By combining decentralized governance with a sustainability-first investment mission, VIRIDIS occupies a hybrid niche: technologically advanced, socially inclusive, and regulation-ready.

3. Strategic Implications

* VIRIDIS can market itself as the first green-tech governance DAO in Europe, establishing thought leadership and attracting investors aligned with ESG principles.
* Competitors may eventually replicate elements of DAO governance, but VIRIDIS’s early adoption creates brand differentiation and reputational capital.
* The positioning aligns with growing investor demand for ESG transparency and stakeholder accountability (Flammer, 2021).
* By embedding DAO structures early, Viridis builds organizational resilience against future regulatory tightening while peers face higher adjustment costs.

4. Risks and Mitigation

Risk: Competitors with larger financial capacity could copy DAO structures once proven.  
Mitigation: VIRIDIS should leverage its first-mover reputation and rapidly scale network effects.

Risk: Market skepticism towards blockchain governance.

Mitigation: Transparent pilot results and EU policy engagement to demonstrate accountability.

8.6 Strategic Alignment with Viridis Mission

The transition to a DAO-based governance model directly supports Viridis’s mission to foster sustainable green-tech innovation and investment. By aligning governance practices with the principles of transparency, inclusivity, and accountability, Viridis reinforces its role as both a catalyst for green investment and a trusted ecosystem leader.

1. Alignment with Core Values

* Sustainability: DAO governance integrates sustainability into organizational decision-making by ensuring stakeholder voices are included in resource allocation. This directly supports Viridis’s mission to promote long-term ecological and financial resilience (European Commission, 2020).
* Transparency: Blockchain-enabled traceability demonstrates a strong commitment to openness, which builds trust with regulators, investors, and civil society (De Filippi & Wright, 2018).
* Inclusivity: Broad stakeholder participation strengthens Viridis’s ecosystem, expanding opportunities for innovation and engagement beyond traditional shareholder-driven structures (Glaser, 2021).

2. Strategic Fit with EU Sustainable Finance Goals

* The EU Green Deal and Sustainable Finance Disclosure Regulation (SFDR) place increasing emphasis on governance that enables measurable environmental impact (European Commission, 2020).
* By adopting DAO governance early, Viridis aligns its operating model with these frameworks, positioning itself as a compliance-ready and future-proof organization.

3. Competitive Advantage Through Mission Alignment

* VIRIDIS differentiates itself by combining technological innovation (DAO, token-based governance) with sustainability-driven investment goals.
* This dual alignment enhances its attractiveness to impact investors and institutional partners seeking both financial returns and verified ESG outcomes (Flammer, 2021).
* The DAO framework operationalizes Viridis’s mission by embedding environmental and social considerations into everyday governance processes, ensuring decisions reflect the company’s broader purpose.

4. Long-Term Strategic Outcomes

* Ecosystem Leadership: Viridis strengthens its reputation as a pioneer of sustainable decentralized governance.
* Scalability: The DAO model enables future expansion to international networks, extending VIRIDIS’s mission beyond regional boundaries.
* Resilience: Mission-driven governance ensures continuity even in volatile markets, as stakeholder trust mitigates risks of disengagement or capital withdrawal (Beck, Müller-Bloch, & King, 2018).

## 8.7 Return on Innovation

The Return on Innovation (RoI) for VIRIDIS captures not only the direct financial benefits of implementing a DAO-based governance model but also the strategic, social, and environmental value generated through innovation. Unlike conventional ROI calculations, RoI incorporates both tangible cost/revenue metrics and intangible gains such as stakeholder trust, compliance readiness, and sustainability leadership.

1. Financial Returns

* Revenue Growth: V-GTI and V-ECO streams contribute to recurring income through investment facilitation and ecosystem services. Moderate adoption yields annual revenues between €100,000–€120,000, with best-case outcomes reaching €160,000 (see 8.4.1–8.4.3).
* Efficiency Gains: Cost savings of €100,000 annually are achieved via reduced administrative overhead, faster reporting, and lower compliance costs (Beck, Müller-Bloch, & King, 2018).
* Payback Period: Even under conservative assumptions, the DAO model achieves breakeven within 2–3 years, with accelerated returns under normal and best-case scenarios.

2. Strategic Returns

* Trust and Transparency: Immutable governance records strengthen investor confidence and compliance credibility (De Filippi & Wright, 2018).
* Regulatory Alignment: By meeting SFDR and CSRD requirements ahead of competitors, Viridis avoids future adjustment costs and strengthens compliance resilience (European Commission, 2020).
* Competitive Positioning: Early adoption creates a first-mover advantage, positioning VIRIDIS as a benchmark for decentralized sustainable governance (Glaser, 2021).

3. Social and Environmental Returns

* Stakeholder Engagement: Inclusive governance encourages broader participation, fostering innovation through diversity of perspectives (Glaser, 2021).
* Sustainable Finance Impact: By channeling investment into verified green technologies, Viridis accelerates environmental goals consistent with the EU Green Deal (European Commission, 2020).
* Positive Spillovers: Greater transparency and accountability promote responsible investment practices that extend beyond VIRIDIS’s immediate network (Flammer, 2021).

4. Innovation Multiplier Effect

The DAO framework serves as a platform for ongoing innovation, enabling new product lines (e.g., ESG data dashboards, compliance assurance services) to emerge. This creates a multiplier effect where governance innovation catalyzes further business innovations, increasing Viridis’s long-term adaptability and resilience.

Conclusion

The Return on Innovation demonstrates that VIRIDIS’s DAO governance is not only financially viable but also strategically transformative. It enhances financial returns, strengthens compliance, and amplifies social and environmental impact, thereby delivering a multi-value return that goes beyond traditional ROI.

**Viridis DAO Governance – Financial Overview**

|  |  |  |  |
| --- | --- | --- | --- |
| **Category** | **Best Case** | **Normal Case** | **Worst Case** |
| **Initial Setup Costs (CAPEX)** | **€200,000 (blockchain infra, dashboard, training)** | **€200,000** | **€200,000** |
| **Annual Operational Costs (OPEX)** | **€120,000 (maintenance, upgrades, compliance)** | **€120,000** | **€125,000 (higher compliance + support costs)** |
| **Annual Revenues (V-GTI + V-ECO)** | **€140,000–€160,000** | **€100,000–€120,000** | **€60,000–€80,000** |
| **Annual Cost Savings** | **€120,000–€140,000 (efficiency + automation)** | **~€100,000** | **~€80,000** |
| **Net Annual Benefit (after OPEX)** | **€140,000–€180,000** | **€115,000–€135,000** | **€55,000–€75,000** |
| **Payback Period** | **~1 year** | **1–1.5 years** | **2–3 years** |
| **Strategic Positioning** | **First-mover, industry leader, ESG benchmark** | **Stable growth, ESG-aligned, competitive niche** | **Moderate adoption, requires stronger engagement** |

Notes:

* + CAPEX assumed constant across all scenarios since infrastructure setup is required regardless of adoption pace.
  + OPEX varies slightly in the worst case due to higher compliance and support costs.
  + Revenues scale directly with stakeholder participation and investment inflows (higher in best case, lower in worst).
  + Cost savings primarily come from reduced admin, reporting automation, and efficiency in governance processes.
  + Payback period is shortest in best case (~12 months) and longest in worst case (24–36 months).

# 9. Implementation and Diffusion

## 9.1 Roadmap for Deployment

The deployment of VIRIDIS’s DAO-based governance model requires a phased roadmap that balances technical integration, stakeholder engagement, and regulatory compliance. The roadmap ensures that adoption is gradual, minimizing resistance while demonstrating value at each stage.

Phase 1: Preparation (Months 1–3)

* Finalize Design: Confirm governance rules, token mechanics, and dashboard features.
* Infrastructure Setup: Deploy blockchain nodes, smart contracts, and internal testing environment.
* Stakeholder Communication: Launch information sessions to introduce DAO principles to employees, investors, and partners.
* Compliance Review: Engage with legal experts to align DAO processes with EU regulations such as SFDR and CSRD (European Commission, 2020).

Phase 2: Pilot Rollout (Months 4–6)

* Limited Token Distribution: Provide governance tokens to a select pilot group of stakeholders (e.g., internal teams and early partners).
* Pilot Voting Rounds: Test token-based decision-making on low-risk governance issues.
* Feedback Loops: Collect insights from participants on usability, trust, and perceived value (Glaser, 2021).
* Adjustments: Refine technical setup, voting parameters, and communication materials based on pilot outcomes.

Phase 3: Full Organizational Rollout (Months 7–12)

* Token Deployment: Distribute governance tokens across all key stakeholders, ensuring proportional representation.
* DAO Dashboard Activation: Enable live tracking of proposals, votes, and decisions for transparency.
* Stakeholder Training: Run workshops for employees, partners, and investors on DAO use and participation benefits.
* Governance Expansion: Move from limited issues to full governance integration, including budget allocation and investment decisions.

Phase 4: Ecosystem Integration (Year 2)

* External Stakeholder Inclusion: Extend DAO participation to NGOs, regulators, and indirect stakeholders.
* V-GTI and V-ECO Integration: Embed DAO governance into investment flows and ecosystem services, ensuring transparent reporting.
* Public Communication: Share results of DAO implementation to build trust and attract new green-tech investors (De Filippi & Wright, 2018).
* Continuous Monitoring: Implement KPIs for participation, decision efficiency, and investment inflows.

Phase 5: Scaling and Internationalization (Year 3 and Beyond)

* Cross-Border Integration: Extend DAO governance beyond Munich HQ to other Viridis hubs and partner networks.
* Partnerships: Collaborate with other sustainability-focused DAOs and financial institutions.
* Innovation Expansion: Use DAO framework to support new services such as compliance assurance dashboards, ESG data marketplaces, and collaborative R&D platforms.
* Regulatory Alignment: Continue adapting to evolving EU Green Deal requirements and international sustainable finance standards.

## 9.2 Risk Analysis and Mitigation Tools

The transition to DAO governance introduces both technical and organizational risks that must be carefully managed to ensure sustainable adoption. A structured risk analysis allows VIRIDIS to anticipate potential challenges and implement effective mitigation tools.

1. Technical Risks

Smart Contract Vulnerabilities  
  
Risk: Exploits or coding errors could compromise governance processes.  
  
Mitigation: Conduct independent security audits, implement upgradeable smart contracts, and maintain bug bounty programs (De Filippi & Wright, 2018).

System Reliability & Downtime  
  
Risk: Blockchain nodes or dashboards may experience outages, disrupting decision-making.  
  
Mitigation: Build redundant infrastructure, adopt decentralized hosting solutions, and introduce fallback manual voting in critical cases (Beck, Müller-Bloch, & King, 2018).

2. Organizational Risks

Low Stakeholder Participation  
  
Risk: Limited engagement reduces legitimacy of DAO governance.  
  
Mitigation: Provide training, incentives (e.g., governance tokens tied to impact metrics), and awareness campaigns (Glaser, 2021).

Resistance to Change  
  
Risk: Employees and partners accustomed to hierarchical governance may resist DAO integration.  
  
Mitigation: Phase in DAO adoption gradually (see roadmap 9.1), include hybrid governance mechanisms during transition, and communicate benefits through workshops.

3. Regulatory and Compliance Risks

Uncertainty in DAO Regulation  
  
Risk: DAO governance may not fit neatly within existing EU legal frameworks.  
  
Mitigation: Maintain active dialogue with regulators, adapt DAO mechanisms to comply with SFDR and CSRD, and integrate off-chain reporting for legal recognition (European Commission, 2020).

Data Privacy Concerns  
  
Risk: Stakeholder identity and decision records may conflict with GDPR requirements.  
  
Mitigation: Implement privacy-preserving technologies such as zero-knowledge proofs (ZKPs) and anonymized voting records (Bodó, Gervais, & Quintais, 2021).

4. Market and Financial Risks

Adoption Lag Among Investors  
  
Risk: Potential investors may hesitate to engage with decentralized governance models.  
  
Mitigation: Showcase pilot results, highlight cost savings and compliance readiness, and build credibility through external validation (Flammer, 2021).

Financial Overruns  
  
Risk: CAPEX or OPEX may exceed initial estimates, delaying payback.

Mitigation: Maintain strict budget monitoring, secure contingency funding, and implement agile budgeting practices.

5. Reputational Risks

Failure of DAO Experimentation  
  
Risk: If DAO implementation fails, Viridis risks reputational damage as a governance innovator.

Mitigation: Start with low-stakes governance decisions, scale gradually, and document both successes and lessons learned to maintain credibility.

## 9.3 Communication Plan (Internal and External)

A successful transition to DAO governance requires clear and consistent communication with both internal and external stakeholders. The communication plan ensures alignment, builds trust, and drives adoption across all levels of VIRIDIS and its wider ecosystem.

1. Internal Communication

Objective: Foster understanding, reduce resistance, and encourage participation in DAO processes.

Channels & Tools:

* + Regular town halls and workshops explaining DAO principles and benefits.
  + Internal newsletters and dashboards with updates on DAO rollout progress.
  + Interactive Q&A sessions with leadership and governance experts.

Key Messages:

* + DAO enhances transparency, inclusivity, and efficiency.
  + Employees’ voices will have direct influence in shaping company strategy.
  + Training and support will ensure ease of adoption.

2. External Communication

Objective: Build credibility with investors, regulators, partners, and the public while positioning Viridis as a leader in sustainable governance innovation.

Channels & Tools:

* + Public press releases and whitepapers explaining DAO implementation and its sustainability benefits.
  + Social media campaigns highlighting milestones and success stories.
  + Participation in conferences, EU forums, and sustainability summits to showcase innovation.
  + Dedicated DAO governance dashboard available to the public, demonstrating transparency in real-time.

Key Messages:

* + VIRIDIS is a first-mover in sustainable DAO governance, aligning with EU Green Deal goals (European Commission, 2020).
  + Decentralized governance builds trust with investors by providing transparent, auditable decision-making (Beck, Müller-Bloch, & King, 2018).
  + The DAO model accelerates green tech investment while ensuring compliance with SFDR and CSRD.

3. Target Audiences and Tailoring

* Employees & Managers: Focus on training, empowerment, and culture change.
* Investors: Emphasize transparency, risk reduction, and financial benefits.
* Regulators: Highlight compliance readiness, reporting alignment, and governance integrity.
* NGOs and Civil Society: Communicate inclusivity, sustainability impact, and transparency in green investment flows.

4. Timing and Frequency

* Preparation Phase (Months 1–3): Awareness campaigns, onboarding workshops.
* Pilot Phase (Months 4–6): Regular updates, feedback collection, and targeted stakeholder dialogues.
* Full Rollout (Months 7–12): External campaigns, public dashboards, industry showcases.
* Scaling (Year 2+): Ongoing communication of results, case studies, and international engagement.

5. Feedback and Adaptation

* Establish two-way communication loops (internal surveys, stakeholder interviews, public forums).
* Use results to adapt communication materials and engagement strategies.
* Document testimonials and case studies for use in diffusion and scaling.

## 9.4 Adoption and Diffusion Strategy

The adoption and diffusion of DAO governance at VIRIDIS requires a strategic approach that ensures both internal uptake and broader ecosystem engagement. By combining phased implementation with proactive ecosystem diffusion, Viridis can position itself as a pioneer in sustainable governance.

1. Internal Adoption Strategy

* Gradual Integration: Start with hybrid governance, where DAO coexists with traditional oversight, before transitioning to full DAO operations (Beck, Müller-Bloch, & King, 2018).
* Training & Onboarding: Provide structured training for employees, investors, and managers to reduce barriers to adoption (Glaser, 2021).
* Incentive Mechanisms: Link governance tokens to tangible outcomes such as participation bonuses, recognition programs, or influence on budget allocations (De Filippi & Wright, 2018).
* Cultural Shift: Promote a narrative of empowerment and inclusion, demonstrating how DAO gives each stakeholder a stronger voice in VIRIDIS’s green tech mission (European Commission, 2020).

2. External Diffusion Strategy

* Showcase Success Stories: Publish results from pilot rounds and early governance cases to demonstrate transparency, efficiency, and impact (Flammer, 2021).
* Strategic Partnerships: Collaborate with universities, NGOs, and EU institutions to diffuse the governance model as a sustainability benchmark (European Commission, 2020).
* Open Knowledge Sharing: Release DAO framework guidelines, whitepapers, and case studies to position Viridis as a thought leader in decentralized governance for green tech (Beck et al., 2018).
* Industry Alliances: Join or initiate consortiums of companies experimenting with decentralized governance, enabling cross-learning and ecosystem validation (De Filippi & Wright, 2018).

3. Scaling Across the Ecosystem

* VIRIDIS Ecosystem Integration: Expand DAO governance into V-GTI (green tech investments) and V-ECO (ecosystem services), ensuring participation from suppliers, partners, and regulators (Glaser, 2021).
* Geographic Expansion: Replicate governance across VIRIDIS’s hubs in other European markets and beyond, adapting for local regulatory requirements (European Commission, 2020).
* Standardization Efforts: Align governance practices with CSRD and SFDR, creating an ESG-compliant DAO model that can be diffused across industries (European Commission, 2020).
* Future-Proofing: Continuously adapt DAO governance tools to emerging technologies such as zero-knowledge proofs and AI-driven decision support systems (Bodó, Gervais, & Quintais, 2021).

4. Adoption Metrics and KPIs

* Internal Metrics: Stakeholder participation rates, voting turnout, proposal acceptance rates.
* External Metrics: Investor inflows, partnership formations, mentions in regulatory and industry reports.
* Impact Metrics: Documented increases in green tech investments, measurable sustainability impact, and stakeholder trust indices (Flammer, 2021).

5. Long-Term Diffusion Vision

VIRIDIS aims to become a reference case for EU sustainable governance, actively shaping the discourse around DAOs and sustainable finance. Adoption is expected to extend beyond VIRIDIS to partners, suppliers, and even competitors, creating a network effect where decentralized governance becomes an industry standard (Beck et al., 2018). Through its leadership role, VIRIDIS positions itself not only as a green tech investor but as a pioneer in transforming corporate governance toward inclusivity and sustainability (De Filippi & Wright, 2018).

## 9.5 Future Scalability and Regulatory Alignment

The long-term success of VIRIDIS’s DAO governance model depends on its ability to scale across organizational units and adapt to evolving regulatory frameworks. Scalability is not only a technical challenge but also an organizational and legal one, requiring robust alignment with EU sustainable finance regulations and industry-wide governance trends.

1. Future Scalability

Technical Scalability:  
The DAO infrastructure must handle increasing numbers of participants, transactions, and proposals. Blockchain-based systems are designed to scale through layer-2 solutions and interoperability protocols, enabling Viridis to expand governance capacity without excessive costs (Bodó, Gervais, & Quintais, 2021).

Organizational Scalability:  
DAO governance should evolve beyond core investment decisions into other areas such as HR policy, sustainability initiatives, and R&D funding. This expansion will ensure that decentralized governance is embedded across the Viridis ecosystem (Glaser, 2021).

Ecosystem Scalability:  
Through partnerships with NGOs, universities, and regulators, VIRIDIS can create a wider governance ecosystem where shared decision-making enhances cross-sector collaboration (Beck, Müller-Bloch, & King, 2018).

2. Regulatory Alignment

EU Green Deal & Taxonomy:  
DAO governance must ensure compliance with the EU Taxonomy for Sustainable Activities, which defines criteria for green investments, and the Green Deal’s decarbonization targets (European Commission, 2020).

Sustainable Finance Disclosure Regulation (SFDR):  
The DAO should embed reporting standards into its dashboards, enabling automated compliance with SFDR requirements for transparency in sustainability-related risks and impacts (European Commission, 2020).  
  
Corporate Sustainability Reporting Directive (CSRD):  
DAO-generated data can be directly integrated into CSRD reports, streamlining mandatory disclosures on governance, sustainability, and stakeholder engagement (European Commission, 2020).

Adaptive Governance:  
Future regulatory developments may impose additional requirements on decentralized systems, such as data protection and accountability standards. Integrating privacy-enhancing technologies (e.g., zero-knowledge proofs) can ensure regulatory resilience (Bodó et al., 2021).

3. Strategic Advantages of Alignment

* Trust with Investors: Transparent compliance builds investor confidence and attracts sustainable capital inflows (Flammer, 2021).
* First-Mover Advantage: VIRIDIS becomes a case study for EU-aligned DAO governance, setting industry benchmarks.
* Reduced Compliance Costs: Automation of reporting within DAO dashboards reduces recurring administrative burdens, creating efficiency gains.

4. Long-Term Vision

VIRIDIS can position itself as a leader in decentralized sustainability governance, shaping future EU policies while scaling its governance framework across Europe and beyond. By combining technological adaptability with regulatory foresight, VIRIDIS ensures that its DAO governance model remains scalable, resilient, and future-ready.

# 10. Conclusion and Next Steps

## 10.1 Key Findings

The research demonstrated that VIRIDIS’s current hierarchical governance model restricts investment growth, limits stakeholder engagement, and creates inefficiencies in decision-making. By contrast, a DAO-based governance model offers a pathway to greater inclusivity, transparency, and alignment with EU sustainable finance regulations. Key findings include:

1. Investment Potential: Decentralized governance increases investor confidence by enhancing transparency and accountability, which are critical in sustainable finance markets (Flammer, 2021).
2. Stakeholder Participation: DAO structures enable broader participation from employees, investors, and external partners, creating network effects that drive engagement in both governance and green tech initiatives (Beck, Müller-Bloch, & King, 2018).
3. Operational Efficiency: Automation of governance processes reduces administrative burdens and creates measurable cost savings, with payback periods between 1–3 years depending on adoption scenarios.
4. Regulatory Alignment: DAO-based systems can integrate directly with CSRD, SFDR, and EU Taxonomy reporting, streamlining compliance processes (European Commission, 2020).
5. Scalability: DAO governance is adaptable across Viridis’s business units and partner networks, making it a strategic tool for long-term growth.

## 10.2 Answer to Research Questions

RQ1: Is having a decentralized governance system better than a traditional governance system as measured by increased investment within the company or by participation rates?  
 Yes. Evidence shows that decentralized governance models improve transparency and accountability, which attract greater investor trust and participation (Glaser, 2021; Flammer, 2021). Participation rates in DAO pilots consistently outperform traditional board-level governance structures.

RQ2: Does more inclusion in decision-making increase active stakeholder participation in other Viridis projects (network effects)?  
 Yes. Broader inclusion leads to positive network effects, where stakeholders involved in governance also contribute more actively to adjacent projects, including V-GTI and V-ECO. The iterative workshops confirmed that when stakeholders feel their input matters, engagement expands beyond decision-making (Beck et al., 2018).

RQ3: Does inclusion and decentralized governance increase investment in green tech versus grey tech?  
 Yes. DAO governance embeds sustainability principles into decision-making, ensuring that capital is directed toward green tech projects rather than short-term grey tech returns. This aligns with EU sustainable finance frameworks and strengthens Viridis’s ESG positioning (European Commission, 2020; De Filippi & Wright, 2018).

## 10.3 Long-Term Implications for VIRIDIS

The adoption of a DAO-based governance system presents long-term implications that go beyond immediate efficiency and participation gains. These implications affect VIRIDIS’s strategic positioning, resilience, and industry leadership in the sustainable finance and green technology ecosystem.

1. Strategic Positioning and Market Leadership

By adopting decentralized governance, VIRIDIS positions itself as a pioneer in sustainable corporate governance. This creates differentiation in the market, attracting investors who prioritize transparency, ESG compliance, and accountability (Flammer, 2021). Over time, Viridis can leverage this first-mover advantage to build industry alliances and influence governance standards across the EU (Beck, Müller-Bloch, & King, 2018).

2. Sustainable Investment Flows

DAO governance embeds sustainability principles directly into decision-making processes, ensuring that long-term investments prioritize green over grey technologies. This not only aligns with the EU Green Deal and Taxonomy but also reduces exposure to regulatory and reputational risks associated with carbon-intensive industries (European Commission, 2020).

3. Organizational Resilience and Innovation

Decentralized governance fosters resilience by distributing decision-making power, making the organization less vulnerable to hierarchical bottlenecks or leadership changes. It also encourages continuous innovation, as a broader range of stakeholders contributes to idea generation, evaluation, and execution (Glaser, 2021).

4. Ecosystem Integration and Network Effects

VIRIDIS can expand DAO governance beyond internal operations into its broader ecosystem, including suppliers, partners, NGOs, and regulators. This integration strengthens collaboration, trust, and knowledge sharing, creating a network effect that enhances Viridis’s role as a sustainability hub (De Filippi & Wright, 2018).

5. Regulatory Alignment and Future-Proofing

As EU regulations evolve, DAO-based governance offers flexibility to adapt reporting, compliance, and audit mechanisms through automated dashboards. VIRIDIS can remain at the forefront of regulatory alignment with SFDR, CSRD, and upcoming EU digital governance frameworks, ensuring long-term compliance and investor trust (Bodó, Gervais, & Quintais, 2021).

6. Long-Term Risks

While DAO governance presents many benefits, long-term risks include potential technology obsolescence, governance capture by dominant stakeholders, and resistance from regulators unfamiliar with decentralized models. Proactive risk management, continuous training, and adaptive governance tools will be necessary to mitigate these challenges (Glaser, 2021).

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# Appendix

## Glossary

**Blockchain** A distributed ledger technology that records transactions in a secure, immutable, and transparent way across a peer-to-peer network. It enables decentralized trust and forms the basis for DAOs and DeFi (Tapscott & Tapscott, 2016).

**Corporate Governance**The structures and processes for the direction and control of companies, traditionally involving hierarchical oversight by boards and executives (OECD, 2019).

**Decentralized Governance**A governance approach where decision-making power is distributed across stakeholders rather than centralized in a hierarchy, often enabled by blockchain technologies (Beck, Müller-Bloch, & King, 2018).

**Hierarchical Governance** A traditional governance model based on top-down authority and centralized decision-making. While effective for oversight, it can limit inclusion and innovation (OECD, 2019).

**DAO (Decentralized Autonomous Organization)**An organization coordinated by smart contracts on blockchain where governance is conducted through token-based voting and transparent rules, reducing reliance on intermediaries (Glaser, 2021).

**Governance Operating Model**A structured framework defining how decision-making authority, responsibilities, and oversight mechanisms are distributed across an organization (OECD, 2019).

**Oversight**The monitoring and supervisory functions carried out by governance structures to ensure accountability, compliance, and performance.

**Transparency**The principle that organizational decisions, processes, and data are openly accessible and traceable, fostering accountability and trust (Flammer, 2021).

**Participation**The involvement of stakeholders in governance, ranging from consultation to direct decision-making authority, measured in engagement and voting activity.

**Finance & Sustainability**

**ESG (Environmental, Social, Governance)** A framework that evaluates the non-financial sustainability performance of firms, focusing on environmental impact, social responsibility, and governance quality (Flammer, 2021).

**Sustainable Finance**The integration of ESG considerations into investment and financing decisions, supporting long-term sustainability goals (European Commission, 2020).

**EU Green Deal**The European Union’s growth strategy aiming to make Europe climate-neutral by 2050 through investment in green technologies and sustainable finance mechanisms (European Commission, 2020).

**EU Taxonomy**An EU classification system establishing criteria to determine whether an economic activity qualifies as environmentally sustainable (European Commission, 2020).

**CSRD (Corporate Sustainability Reporting Directive)**An EU regulation requiring companies to disclose sustainability performance, governance risks, and ESG data in standardized formats (European Commission, 2020).

**SFDR (Sustainable Finance Disclosure Regulation)**An EU regulation mandating financial institutions and firms to disclose sustainability risks and ESG impacts in their investment processes (European Commission, 2020).

**CAPEX (Capital Expenditures)**Funds invested in acquiring or upgrading long-term assets, such as technologies or infrastructure needed for DAO implementation (OECD, 2019).

**OPEX (Operational Expenditures)**Recurring costs required to run daily operations, such as platform maintenance, compliance monitoring, and staff training.

**Payback Period**The time required for the benefits or savings of an investment to recover the initial costs.

**Return on Innovation (RoI²)** A performance measure evaluating the financial and strategic benefits generated from innovation investments compared to costs (Glaser, 2021).

**Green Tech**Technologies that directly contribute to environmental sustainability, such as renewable energy or circular economy solutions (Flammer, 2021).

**Grey Tech**Technologies with economic potential but minimal environmental benefits, often associated with carbon-intensive industries.

**Technology & Blockchain**

**Smart Contracts**Self-executing agreements written into blockchain code that automatically enforce rules and obligations (De Filippi & Wright, 2018).

**Tokenization**The process of representing assets, rights, or governance votes as digital tokens on blockchain, enabling transparent and traceable participation (Tapscott & Tapscott, 2016).

**Token Voting**A governance mechanism where stakeholders use digital tokens to vote on proposals, ensuring proportional and transparent decision-making (Glaser, 2021).

**Trust Service Providers (TSPs)**Entities that manage digital certificates, verification, and identities within blockchain systems to ensure trust and compliance (Bodó, Gervais, & Quintais, 2021).

**DeFi (Decentralized Finance)**A blockchain-based financial ecosystem that eliminates intermediaries, enabling peer-to-peer transactions, lending, and governance through decentralized protocols (WEF, 2021).

**Dashboard (Governance Context)**A digital interface that provides stakeholders with real-time visibility into governance activities, voting outcomes, and sustainability metrics.

**Infrastructure & Technology Adoption**The systems and cultural readiness required for organizations to implement new technologies, including digital tools, platforms, and governance processes (OECD, 2019).

**Innovation & Ideation**

**SCAMPER Method**A structured ideation framework (Substitute, Combine, Adapt, Modify, Put to another use, Eliminate, Reverse) used to develop innovative solutions (Michalko, 2006).

**Heatmap Analysis**A visual tool for rating and comparing multiple ideas across different criteria, such as feasibility, impact, and stakeholder appeal.

**Iteration**The process of refining ideas or solutions across multiple development cycles (Rounds 1–3), incorporating stakeholder feedback each time (Glaser, 2021).

**Stakeholder Mapping**A method to identify, classify, and visualize stakeholders based on influence, interest, and engagement levels (Beck et al., 2018).

**Network Effects**The phenomenon where a product, service, or governance model gains value as more users or stakeholders participate (Beck et al., 2018).

**Multi-perspective Change Scenarios**Structured narratives showing how different stakeholder groups (e.g., employees, regulators, investors) may respond to governance reforms.

**Prototyping**The creation of early-stage models (such as dashboards or token voting flows) to test usability and gather stakeholder feedback (WEF, 2021).

**Pilot Workshops**Small-scale, trial implementations of governance reforms designed to test ideas and validate stakeholder acceptance.

**Diffusion Strategy**The planned process of spreading and scaling innovation, ensuring adoption across direct and indirect stakeholders (WEF, 2021).

* 1. Detailed Problem Analysis & Detailed Stakhodler analysis

A.1 Detailed Stakhodler analysis

Internal Stakeholders

* Board of Directors: Holds ultimate decision-making authority under the current hierarchical model. Critical for approving governance reforms and allocating resources.
* Executive Management: Responsible for translating governance policies into operational action. Their buy-in is essential for transitioning to decentralized processes.
* Employees: Provide technical expertise in green technologies and execute project activities. Their participation in governance is currently limited but essential for cultivating ownership and collective motivation.

External – Direct Stakeholders

* Investors (Equity and ESG-Focused Funds): Provide capital and increasingly demand transparency, participatory governance, and alignment with EU sustainable finance regulations.
* Project Partners (Consortiums, SMEs, Universities): Collaborate with Viridis on R&D, pilots, and implementation of green technologies. They require inclusive decision-making channels to sustain long-term partnerships.
* Clients/Customers: Both B2B and institutional buyers of green technologies who expect Viridis to maintain credibility, sustainability compliance, and governance transparency.

External – Indirect Stakeholders

* Regulators and Policymakers (EU, National Authorities): Define the sustainable finance frameworks (e.g., EU Taxonomy, SFDR, CSRD) that Viridis must comply with to secure investment.
* NGOs and Civil Society Organizations: Act as watchdogs and partners in ensuring environmental and social alignment. Their endorsement can improve legitimacy and market credibility.
* Industry Associations and Standards Bodies: Influence the adoption of governance models and sustainability standards within the sector.
* Competitors and Peers: Indirectly shape governance choices by setting benchmarks and influencing investor expectations.
* Local Communities: Particularly those near Viridis’s operations and facilities, as their support or opposition can impact the company’s license to operate.

Implications for Governance Transition

1. Investor Expectations – ESG-focused investors are likely to be the strongest drivers for adopting decentralized governance due to their demand for transparency and accountability.
2. Employee Engagement – Bringing employees into governance will be crucial for creating a participatory culture and stimulating cross-project collaboration.
3. Regulatory Alignment – Policymakers and regulators require verifiable, transparent governance systems; failure to align may limit access to green finance.
4. Ecosystem Legitimacy – NGOs, partners, and civil society stakeholders can provide legitimacy and strengthen Viridis’s competitive position if meaningfully included.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Stakeholder Category | Specific Stakeholders | Role & Responsibilities | Interests & Expectations | Participation & Engagement |
| Internal Stakeholders | VIRIDIS Management | Strategic decision-making, resource allocation, steering project direction. Includes founder and CEO Josef Zacharias Köhl and CEO of VECO, Friedrich Rackwitz. The Supervisory Board with Hendrick Lasser, Florian Renner, Dr. Andreas v. Aufschnaiter oversees the corporate governance. | Successful project implementation, strengthening corporate reputation, achieving financial goals and strategic visions. Josef Z. Köhl is primarily interested in promoting sustainability goals, climate neutrality, transparency, and accountability. | Full involvement in key decisions and milestones. Weekly updates and access to information via platforms like Google, Discord, Miro, or Workadventure. Regular meetings on important decisions and milestones. |
|  | VIRIDIS Employees & Internal Researchers | Primary actors of change, most affected by the transition to transparency and sustainability. They provide input for new processes, participate in training, and apply new methods. Examples include Michael Hopf (Project Manager, Business Developer), Christian Verhoef (Lab Leader, Technology and Policy Expert), and Jan Philipp Knebel and Sophia Geissler (Research/Reporting). | Operational efficiency, building trust, long-term sustainability. Michael Hopf is interested in promoting sustainability goals and building partnerships. Christian Verhoef values systemic sustainability changes through technology and policy. | Continuous engagement for input, feedback, and training. Christian Verhoef wants more inclusivity in decision-making. Michael Hopf wants more focused responsibilities. |
| External Stakeholders | Investors (including "First Founders") | Providing capital and strategic advice. Josef Z. Köhl also classifies himself as an investor. Hubertus Haller von Hallerstein is a strategic investor. Stefan Langer is an investor and founds other companies. The 31 "First Founders" represent a unique subgroup combining financial investments with active participation in ecosystem development and mentoring. | Return on Investment (ROI), scalability. Strong interest in new technologies (especially blockchain), networking, and mentoring. Desire for transparent reporting and participation in decision-making. Hubertus HvH expects access to information without asking, e.g., the ecological footprint. Markus Steiner is interested in long-term projects and promoting sustainable innovations. | Receive regular financial updates and have the opportunity to participate in decision-making processes. VIA Security Tokens enable direct profit sharing and voting rights on important decisions. There are plans for stakeholder education programs on blockchain technology to overcome resistance and build trust. |
|  | Political Decision-Makers & Regulatory Authorities | Ensuring compliance with regulations. They monitor compliance and set sustainability standards. Hubertus Haller von Hallerstein also classifies himself as a political decision-maker. Palaash Gupta is also listed as a political decision-maker and sustainability expert. | Compliance and adherence to sustainability standards. | Engagement through open communication channels and participation in advisory committees. Continuous submissions to regulatory authorities with an open channel for their feedback. |
|  | Civil Society & NGOs | Advocating for accountability and societal impact. They demand transparency and collaboration on sustainability campaigns. | Transparent reporting on sustainability metrics and societal impacts. Collaboration on advocacy campaigns and community initiatives. | Engaged through surveys and feedback mechanisms. Irregular meetings for in-depth discussions. |
|  | Corporate Partners & Startups (in the VIRIDIS Cluster) | Active participation in ecosystem development and mentoring. Examples of portfolio companies include Haepsi, AlgaeRithm, Filedgr, MingaGreens, GOC Nexus, OVID Clinic Berlin, and Pangea Virtual Nation. | Access to accelerator and incubator programs of the Project Hub. Opportunities to co-develop and test innovative solutions within the Physical Hub. | Participation in collaborative innovation initiatives. Promoted through the hub structure (Invest, Project, Physical Hub) to integrate financial resources, project-related collaboration, and physical infrastructure. |
|  | Researchers & Academic Institutions | Knowledge contribution and provision of third-party validation. Christian Verhoef (Lab Leader at a technical college) is an example of an involved researcher. | Funding for sustainability research projects. Access to laboratories and facilities for experimentation. | Involvement to ensure cutting-edge research and to validate credibility. Planned workshops at universities to promote understanding of Web3 technologies. |

Table 1 Stakeholder Overview (S.Geissler 2025)

A.2 Governance Inefficiencies at VIRIDIS

Here is a short summary of the current governance infrastructure of VIRIDIS is structured under a Cluster Management Organization (CMO) which oversees two primary legal entities:

1. VIRIDIS Green-Tech Investment AG (V-GTI): Focused on commercial and financial operations, particularly startup investment and capital coordination.
2. VIRIDIS Eco-System gGmbH (V-ECO / VES): Dedicated to social, ecological, and nonprofit initiatives, supporting stakeholder engagement and sustainability projects.

1. Both entities operate through a unified Hub Model, the operational backbone of VIRIDIS, which includes:

Invest Hub: Manages financial coordination and investment activities.

Project Hub: Oversees startup support, cross-functional collaboration, and project execution.

Physical Hub: Handles the infrastructure and physical locations (e.g., cluster centers, innovation spaces).

Structure:

The organization exhibits high transparency internally, particularly among the   core team, but access is limited for external shareholders.

Communication structures are informal and evolve rapidly, often relying on personal relationships and meetings.

A critical need has been identified for a unified “Single Source of Truth” and clear role definitions across the organization.

Oversight Responsibilities:

The governance structure includes a Board of Directors (guiding innovation and sustainable growth), a General Advisory Board (offering strategic expertise), and an Investor Board (First Investors called First Founders) involved in financial decision-making.

Leadership is primarily concentrated in Josef Z. Köhl, who serves as both Founder/CEO of V-GTI and Managing Director of V-ECO. He acts as a meta-level integrator for the entire VIRIDIS vision.

Other key figures include Lars Friedrich Rackwitz (Managing Director, V-ECO) and Michael Hopf (Strategic Project Manager and Executive Assistant).

Governance challenges include over-reliance on Josef, limited delegation, and blurred accountability lines.

Talent & Culture:

Performance Management is undefined; success is currently measured through informal criteria such as perceived impact or investment traction. There is no standardized system to track or assess performance.

Operating principles emphasize agility, sustainability, and mission-alignment. VIRIDIS prioritizes scalable startup support and network-driven ecosystem growth.

Talent Development is critical but hindered by resource constraints and a limited talent pool. A more empowering and inclusive culture is needed to support retention and innovation.

The organizational goal is to cultivate an environment where individuals can operate freely, creatively, and safely.

Infrastructure:

Policies & Procedures:

Current procedures lack standardization. There is a clear ambition to implement transparent digital governance processes, especially in partner selection and internal approvals.

Reporting & Communication:

The communication strategy is fragmented. Stakeholder interviews reveal a strong need for structured, multi-level communication tools. Suggested improvements include real-time dashboards, AI-personalized reports, and a centralized knowledge base using tools such as Discord, feedback forms, and shared archives.

Technology:

The digital infrastructure is still under development. There is no centralized platform for data aggregation or cross-entity collaboration. A unified and consistent information flow is urgently required to support growth and transparency.

Analysis of current Situation

Structure: The dual- enterty structure leads to complexity. Leadership remains heavily centralized in individuals such a Josef Koehl. As well is the communication between the two enterties difficult.

Oversight Responsibilities: A Board exists but offers limited strategic oversight. The Reporting is manual and fragmented.

Telent & Culture: Informal communication patterns and undefined roles boundries reduce efficiency and puts a high stress level on the staff.

Infasturcture: Limited automation, lack of transparency dashboards, over-reliance on Excel, Google Drive and PDFs.

Assessment of Current Gaps and Inclusion Challenges in Decision-Making

VIRIDIS faces a critical challenge in aligning its dual-entity organizational structure with its commitment to transparency, inclusivity, and sustainable innovation. All information are provided in the GP2 by S.Geissler.

Limitations due to the Hierarchical Governance Structure

The current traditional hierarchical framework limits stakeholder participation hinders traceability in decision making, and creates systemic inefficiencies. This undermines the long-term vision of VIRIDIS and reduces trust among stakeholders.

Decision-making remains highly centralized, with 78% of key decisions requiring the approval of the founding management. This has led to bottlenecks and limited the organization's agility and responsiveness.

Qualitative insights reveal frustration over the lack of a transparent and inclusive governance structure.

The lack of system automation has led to inefficiencies, with project delays of 20% to 30%. Unclear workflows and insufficiently defined roles were cited as significant barriers to greater operational efficiency.

Lack of Transparency and Communication

A stance of a centralized, transparent system for tracking investments and monitoring operational performance.

65% of stakeholders express dissatisfaction with existing manual reporting processes, as they often exhibit delays and inaccuracies that hinder effective oversight.

Only 54% of respondents felt sufficiently informed about VIRIDIS's ongoing initiatives and progress. This perceived lack of transparency correlates with low participation rates in collaborative governance and decision-making processes.

The field study revealed an excessive reliance on informal communication and personal relationships at VIRIDIS, which undermines transparency.

Challenges in Technology Adoption and Change Management

Although blockchain and Web3 technologies have been highlighted as important tools for increasing transparency, the field study showed limited understanding and low willingness among stakeholders to adopt these technologies.

There is resistance to technology, lack of trust in decentralized systems, and concerns regarding data protection.

Cultural and organizational resistance to change was observed among long-standing stakeholders accustomed to traditional governance models.

Summary

VIRIDIS’s current governance model is hierarchical, with decision-making concentrated in a small group of executives and board members. While this structure provides efficiency in routine management, it creates barriers to stakeholder engagement, slows innovation, and limits investment appeal. Stakeholder interviews conducted in GP2 and GP3 highlighted recurrent concerns:

* Slow responsiveness to green tech opportunities compared to competitors.
* Opaque decision-making processes, with limited access to information for non-board stakeholders.
* Low inclusivity in strategic discussions, leading to disengagement among employees and partners.

These inefficiencies diminish trust among investors, who increasingly demand transparent and ESG-aligned governance structures (OECD, 2019).

Key Gaps & Outcome

·         Transparency and traceability are not systematized.

·         Lack of Stakeholders accessible, real-time governance data.

·         Operational inefficiencies delay project timelines.

·         Collaboration is impeded by non-standardized processes

Key Insights and Takeaways

Regarding the Four-Pillar by Governance Operating Model by James Howell (July 2, 2024) analysis revealed deep-seated structural and operational limitations within VIRIDIS. The centralization of authority around a single individual, the absence of standardized procedures, and fragmented digital systems collectively reduce the organization’s ability to scale effectively. Talent development is ad hoc, with a lack of incentives and defined performance systems. Infrastructure shortcomings, especially in reporting and communication, hamper transparency and stakeholder trust.

Critically, the Four-Pillar model demonstrated that these issues are interconnected: limited oversight hampers clarity in structure; weak infrastructure obstructs talent development; and vague performance systems dilute accountability. Solving one area without addressing the others risks perpetuating inefficiencies. This insight underpins the need for a holistic, system-level redesign of governance—anchored in decentralization, clarity, and inclusivity.

In summary, the current VIRIDIS governance infrastructure reveals several promising foundations, particularly its dual-entity setup and commitment to sustainability. However, it is hindered by centralization, lack of systematization, and underdeveloped digital and procedural infrastructure. These issues form the basis for the proposed solution design in the following chapters.

A.3 Risk & Opportunities and Financial and Investment Barriers and Scenarios in details

The financing gap for sustainable technology is well documented across the EU. Despite initiatives such as the EU Green Deal and Sustainable Finance Disclosure Regulation (SFDR), small-to-medium-sized firms like VIRIDIS struggle to access capital (European Commission, 2020). Primary causes include:

* High reporting burdens required by CSRD/SFDR.
* Limited proof of governance innovation, reducing investor confidence.
* Dependence on traditional fundraising, which often favors grey tech with lower compliance risks.

This barrier reinforces the urgency of transitioning toward a decentralized governance model that demonstrates transparency and alignment with sustainable finance frameworks (Flammer, 2021).

**SWOT Analysis**

The SWOT framework (Strengths, Weaknesses, Opportunities, Threats) is a widely used strategic tool for assessing organizational transitions and external environments (Gürel & Tat, 2017). In the case of VIRIDIS, it is applied to compare the potential of a decentralized governance model against the current traditional hierarchical system. The purpose of this analysis is to capture both internal factors (strengths and weaknesses) and external factors (opportunities and threats) that influence VIRIDIS’s governance reform. By doing so, the SWOT provides a structured bridge between organizational challenges and broader sustainability and finance opportunities identified in the EU Green Deal and ESG frameworks (European Commission, 2020).

**Strengths (**Internal, Positive):VIRIDIS’s transition to decentralized governance brings higher transparency, inclusion, and accountability, which strengthens stakeholder trust. It also enables network effects, meaning participation grows as more actors engage.

**Weaknesses** (Internal, Negative):The model introduces technical complexity that requires expertise and training. There may be cultural resistance from employees and managers used to hierarchy, while **initial implementation costs** create financial strain.

**Opportunities (**External, Positive):The shift aligns with **EU** Green Deal and ESG frameworks, creating access to new streams of sustainable finance. IRIDIScan attract ESG-focused investors and differentiate itself in the green tech market.

**Threats** (External, Negative):Risks include **regulatory uncertainty** under evolving EU laws (e.g., MiCA, GDPR, ESG disclosures). Poorly managed decentralization could lead to **governance fragmentation**, low adoption, or new **operational and financial risks**.

**Short Summary**

The SWOT analysis highlights that decentralization offers VIRIDIS strong internal advantages, such as transparency and trust, while opening opportunities for financing and market differentiation in line with EU sustainability frameworks. However, the transition also faces internal weaknesses like technical and cultural barriers, alongside external threats from regulatory uncertainty and governance complexity. Taken together, the SWOT underscores that VIRIDIS can leverage decentralization as a **competitive advantage** if risks are carefully managed through phased implementation and compliance alignment.

Opportunities & Risks

Opportunities

1. Access to Sustainable Finance  
   By adopting decentralized governance, VIRIDIS positions itself within the EU’s sustainable finance framework, potentially attracting new streams of green investment capital. The European Commission estimates that between €175 and €290 billion in additional yearly investment is required to meet Green Deal targets by 2050, with strong incentives for private capital to flow into firms that demonstrate transparency and sustainability (European Commission, 2020).
2. Enhanced Stakeholder Engagement  
   Decentralized structures (e.g., DAO-inspired governance) promote inclusion and participation, enabling Viridis to increase stakeholder trust and loyalty. This participatory model can create network effects, where more stakeholders contribute actively to projects, fostering innovation and collective ownership of outcomes (Werner & Zarnekow, 2020).
3. Competitive Differentiation  
   In industries increasingly scrutinized for ESG (Environmental, Social, Governance) compliance, adopting a transparent and verifiable governance structure provides a unique market positioning. Blockchain-enabled systems can ensure auditability, tamper resistance, and resilience in organizational decision-making (Atzori, 2018).
4. Scalability and Innovation  
   By leveraging decentralized decision-making, Viridis can integrate emerging technologies (smart contracts, token-based incentives) and expand its ecosystem of partners and investors. Such innovation can foster long-term competitiveness, moving Viridis from being a reactive firm to a proactive industry leader.

Risks

1. Regulatory Uncertainty  
   EU institutions recognize the potential of decentralized governance but also warn of unresolved regulatory, legal, and compliance hurdles. Misalignment with evolving regulations (e.g., MiCA, GDPR, ESG disclosure requirements) could hinder adoption or expose Viridis to compliance risks (European Parliament Resolution, 2016/2007 INI; Atzori, 2018).
2. Technological Complexity and Adoption Barriers  
   While blockchain and DAO frameworks provide transparency, they are technically complex and require cultural and organizational adaptation. Resistance to change, lack of technical expertise, or failed pilot implementations could undermine stakeholder trust and result in reputational setbacks (Werner & Zarnekow, 2020).
3. Governance Fragmentation  
   Decentralization without clear orchestration may lead to decision-making inefficiency, conflict, or deadlock. Without well-designed governance mechanisms, such as decision rights allocation and consensus processes, VIRIDIS risks creating ambiguity rather than clarity in its organizational processes (Werner & Zarnekow, 2020).
4. Financial and Operational Risks  
   Transitioning to a new governance system entails significant upfront costs like technology implementation, training, change management and without guaranteed immediate returns. Poorly managed rollouts may increase operational inefficiency and erode investor confidence.

A.4 Organizational Culture and Stakeholder Participation

VIRIDIS’s culture has traditionally prioritized technical innovation over governance reform. Employee surveys (GP2) reveal that while staff are committed to the sustainability mission, they feel excluded from high-level decision-making. This exclusion weakens morale and reduces initiative-taking.

At the same time, external stakeholders (NGOs, academic partners, investors) report difficulty engaging with Viridis projects due to unclear channels of communication. Evidence from other industries suggests that decentralized governance, particularly via DAOs, can amplify network effects by encouraging broader participation (Beck et al., 2018).

A.5 Technology and Infrastructure Gaps

Viridis lacks a unified digital governance infrastructure. Decision-making, voting, and reporting are conducted through fragmented platforms, including email, spreadsheets, and closed meetings. This fragmentation creates:

* Data silos that reduce transparency.
* High operational inefficiencies, with repeated manual reporting.
* Weak compliance readiness, as CSRD requires verifiable, structured disclosures.

Blockchain-based solutions, particularly tokenized voting and governance dashboards, can address these gaps by embedding auditability and accountability into the organizational infrastructure (Glaser, 2021; World Economic Forum, 2021).

A.6 Risks in Maintaining the Status Quo

If Viridis fails to reform its governance model, it faces the following risks:

* Investor flight toward competitors that provide more transparent and ESG-compliant governance.
* Regulatory non-compliance, particularly under EU CSRD and SFDR frameworks.
* Loss of stakeholder trust, leading to reduced participation in projects.
* Missed opportunities to lead in the green technology market, ceding ground to firms adopting DAO-based models.

A.7 Opportunities in Transition

Despite the challenges, the transition presents opportunities:

* Access to sustainable finance through alignment with EU taxonomy and green bond markets.
* First-mover advantage in DAO-driven governance within the green tech sector.
* Enhanced stakeholder loyalty through transparent, participatory processes.
* Long-term efficiency gains from reduced transaction costs, automated reporting, and stronger compliance tools.

B. Stakeholder Maps and Classification Tables

VIRIDIS operates within a complex ecosystem of internal and external stakeholders. Based on GP1 and GP2 interviews and secondary research, stakeholders were identified and categorized according to influence, interest, and role in governance transformation.

Table B.1 – Key Stakeholders by Category

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Category | Stakeholder Group | Examples | Role in Governance Transition | Interest Level | Influence Level |
| Internal | Board of Directors | Executive team, governance committee | Strategic decision-making | High | High |
|  | Employees | Engineers, operations, sustainability staff | Operational feedback, adoption | Medium | Medium |
| Investors | Institutional Investors | ESG-focused funds, green bond issuers | Capital provision, oversight | High | High |
|  | Retail Investors | Crowdfunding participants, token holders | Voting power, liquidity | Medium | Medium |
| External Partners | Academic Institutions | Windesheim, EU research collaborations | Knowledge sharing, validation | Medium | Medium |
|  | NGOs & Civil Society | Climate NGOs, environmental groups | Legitimacy, advocacy | High | Medium |
| Regulators | EU Institutions | European Commission, ESMA | Compliance, legal frameworks | High | High |
|  | National Regulators | BaFin (Germany), AFM (Netherlands) | Market oversight | Medium | High |
| Ecosystem Actors | Technology Providers | Blockchain platforms, DAO tooling firms | Infrastructure support | Medium | Medium |
|  | Competitors & Industry Peers | Other green tech firms | Benchmarking, diffusion | Low | Medium |

B.2 Stakeholder Mapping (Influence vs. Interest Matrix)

Stakeholders were mapped according to Mendelow’s Matrix (influence vs. interest) to guide engagement priorities.

Figure B.1 – Influence vs. Interest Matrix

|  |  |  |
| --- | --- | --- |
| Influence \ Interest | Low Interest | High Interest |
| High Influence | Regulators, Competitors | Investors, Board of Directors |
| Low Influence | Technology Providers | Employees, NGOs, Academia |

* High Influence, High Interest: Investors and board members must be engaged closely through transparent governance dashboards and token-based voting.
* High Influence, Low Interest: Regulators and competitors must be kept satisfied through compliance reporting and industry benchmarks.
* Low Influence, High Interest: Employees and NGOs need participation channels to sustain motivation and legitimacy.
* Low Influence, Low Interest: Technology providers should be monitored but not heavily prioritized.

B.3 Stakeholder Engagement Classification

Engagement levels were classified into four groups based on participation potential and governance needs.

Table B.2 – Stakeholder Engagement Levels

|  |  |  |  |
| --- | --- | --- | --- |
| Engagement Type | Stakeholder Groups | Engagement Mechanism | Frequency |
| Key Decision-Makers | Board, Investors | DAO voting, advisory committees, strategy workshops | Quarterly |
| Active Participants | Employees, NGOs | Token voting, participatory budgeting, project forums | Ongoing |
| Consulted Partners | Academia, Technology Providers | Joint research projects, technical pilots | Bi-annual |
| Informed Stakeholders | Regulators, Competitors, Wider Community | Reports, dashboards, newsletters | Annual / On-demand |

B.4 Multi-Perspective Change Scenarios

Scenario development considered how each stakeholder group reacts to a decentralized governance rollout:

* Investors: Increased trust and capital inflows if transparency is achieved; risk of withdrawal if technology is poorly explained.
* Employees: Higher morale and initiative if voting and idea submissions are recognized; resistance if tools are complex.
* NGOs: Likely to advocate for Viridis as a governance pioneer; risk of criticism if inclusivity is only symbolic.
* Regulators: Acceptance depends on compliance with CSRD and SFDR; misalignment could result in penalties.
* Academia: Strong incentive to collaborate if data is openly shared; disengagement if results remain proprietary.

Scenarios in detail

1. Best-Case Scenario

Assumptions:

* + Strong adoption of DAO governance with high stakeholder participation (>70%).
  + Rapid market uptake of V-GTI and V-ECO platforms.
  + Favorable EU policy environment and subsidies for green investment.
  + Network effects accelerate collaboration across Viridis’s ecosystem.

Financial Outcomes:

* + Annual Revenues: €140,000–€160,000.
  + Annual Cost Savings: €120,000.
  + Net Annual Benefit after OPEX: €175,000–€195,000.
  + Payback Period: <1 year.

Strategic Implication:

VIRIDIS becomes a first mover in DAO governance for green tech, enhancing brand value and investor confidence. Scaling to international ecosystems becomes viable.

2. Normal-Case Scenario

Assumptions:

* + Moderate adoption (40–60% participation).
  + Gradual but steady revenue growth in V-GTI and V-ECO.
  + Compliance obligations remain stable under current EU frameworks.
  + Moderate efficiency gains realized through DAO automation.

Financial Outcomes:

* + Annual Revenues: €100,000–€120,000.
  + Annual Cost Savings: €100,000.
  + Net Annual Benefit after OPEX: €115,000–€135,000.
  + Payback Period: 1–1.5 years.

Strategic Implication:

VIRIDIS consolidates a stable governance and financial base while retaining flexibility to expand adoption and refine DAO features.

3. Worst-Case Scenario

Assumptions:

* + Low adoption (<30%) with resistance from some stakeholders.
  + Slower-than-expected growth of V-GTI and V-ECO revenues.
  + Higher-than-expected OPEX due to additional compliance or security costs.
  + Limited network effect and low ecosystem engagement.

Financial Outcomes:

* + Annual Revenues: €60,000–€80,000.
  + Annual Cost Savings: €80,000.
  + Net Annual Benefit after OPEX: €55,000–€75,000.
  + Payback Period: 2–3 years.

Strategic Implication:

Even in a worst-case scenario, the DAO model remains financially viable though with extended payback. Viridis must double down on stakeholder engagement and pilot results to accelerate trust and adoption.

C. Ideation Workshop Materials

C.1 Introduction to the Ideation Process

The ideation phase was designed to create, test, and refine potential governance innovations for VIRIDIS. It relied on structured creativity methods and participatory workshops with stakeholders from GP2 and GP3. The iterative design approach ensured that ideas were not only novel but also grounded in feasibility, stakeholder validation, and alignment with sustainability goals.

Workshops included:

* SCAMPER technique to trigger divergent thinking.
* Iteration rounds (three cycles) of idea generation, refinement, and consolidation.
* Heatmap analysis to prioritize ideas based on feasibility, stakeholder value, and investment potential.

C.2 SCAMPER Method Application

A screenshot of a computer screen

AI-generated content may be incorrect.

Figure 16 The SCAMPER framework (Michalko, 2006) stakeholders in rethinking VIRIDIS’s governance model S.Geissle

The SCAMPER framework (Michalko, 2006) guided stakeholders in rethinking VIRIDIS’s governance model. Each dimension generated targeted discussion and brainstorming outcomes:

Table C.1 – SCAMPER Applied to Viridis Governance

|  |  |  |
| --- | --- | --- |
| SCAMPER Dimension | Application to VIRIDIS Governance | Example Idea Generated |
| Substitute | Replace board-only decisions with collective token voting. | DAO-based decision-making replacing hierarchical votes. |
| Combine | Merge sustainability reporting with governance dashboards. | ESG + DAO dashboard for investors and regulators. |
| Adapt | Adapt existing DeFi governance models to Viridis. | Token-weighted voting linked to green performance. |
| Modify | Modify voting thresholds for inclusivity. | Quadratic voting to balance small and large investors. |
| Put to another use | Use blockchain traceability for compliance reporting. | Automatic CSRD/SFDR data logging. |
| Eliminate | Remove redundant reporting systems. | One unified digital governance platform. |
| Rearrange | Shift decision-making earlier in project cycles. | Stakeholder input during design stage of green tech pilots. |

C.3 Iteration Round 1 – Idea Generation

The first workshop produced a wide range of raw ideas from stakeholders. Key outcomes included:

* Tokenized governance system with transparent voting.
* Hybrid governance model combining board oversight with DAO participation.
* Sustainability-linked tokens rewarding participation aligned with ESG goals.
* Interactive governance dashboard for real-time decision visibility.

Stakeholder input revealed strong enthusiasm but also concerns over technological complexity.

A screenshot of a computer

AI-generated content may be incorrect.

Figure 17 Meeting of Stakeholder review & future desicions

C.4 Heatmap Analysis and Prioritization

To evaluate Round 1 ideas, participants rated them across three criteria: feasibility, stakeholder value, and investment attractiveness. Results were plotted on a heatmap.

Table C.2 – Heatmap Ratings of Round 1 Ideas

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Idea | Feasibility | Stakeholder Value | Investment Attractiveness | Priority Outcome |
| Tokenized governance DAO | Medium | High | High | Priority A |
| Hybrid governance model | High | Medium | Medium | Priority B |
| ESG-linked participation tokens | Medium | High | High | Priority A |
| Governance dashboard | High | High | High | Priority A |

C.5 Iteration Round 2 – Refinements

Round 2 focused on refining the top ideas. Adjustments included:

* DAO Design: Simplified interface for employees with low technical literacy.
* Dashboard: Integration of real-time sustainability metrics (carbon savings, energy use).
* Token Mechanics: Designed hybrid model (reputation + stake-based voting).
* Risk Controls: Added phased rollout to reduce disruption.

C.6 Iteration Round 3 – Final Selection

The final round consolidated the refinements and prioritized an Optimal Innovation Solution:

* DAO-based governance model with hybrid reputation/stake voting.
* Integrated governance dashboard linked to CSRD/SFDR compliance.
* Sustainability participation tokens incentivizing active contributions.
* Phased roadmap (pilot, scale-up, full adoption).

This final package was selected as the most innovative, feasible, and investment-attractive solution for Viridis.

C.7 Key Takeaways from Ideation Workshops

* The SCAMPER method encouraged non-linear, creative thinking while keeping ideas grounded in governance needs.
* Iterative refinement ensured stakeholder buy-in, moving from raw concepts to a practical DAO governance package.
* Heatmap analysis provided a transparent, quantitative prioritization method.
* The final solution aligns governance transformation with EU sustainable finance requirements and stakeholder engagement demands.

D. Heatmap Results and Iteration Notes

Methodology

The heatmaps were created during the GP3 ideation workshops to evaluate the impact of governance innovation ideas across three iterative rounds. Each round gathered feedback from stakeholders (direct and indirect), using a visual rating system:

“++” = strong positive impact  
  
“+” = moderate positive impact  
  
“0” = neutral or negligible impact

Evaluation criteria were grouped into two dimensions:

1. Governance Operating Model Dimensions: structure, oversight responsibilities, talent & culture, infrastructure.
2. Strategic Objectives: trust & inclusion, transparency, efficiency & resilience, innovation leadership, scalability.

This iterative scoring provided evidence-based input for narrowing down the optimal governance model for VIRIDIS.

D.1 Iteration Round 1 – Initial Idea Generation

Ideas Tested:

* + Smart Contracts
  + DAO or DAC structures
  + Token-based Voting Mechanism
  + Blockchain Dashboards

Results (Figure D.1 & D.2):

* Structure & Oversight: DAO/DAC and Smart Contracts received the strongest evaluations (++), showing that stakeholders believed they could strengthen governance accountability and reduce administrative bottlenecks.
* Talent & Culture: DAO/DAC scored positively (++), reflecting its potential to enhance inclusivity and decentralize participation. Token voting and dashboards scored lower (+).
* Infrastructure: Smart Contracts (++), Token Voting (+), and Dashboards (0–+) showed split results, with infrastructure readiness already flagged as a barrier.
* Strategic Objectives: Trust & inclusion and transparency were rated high (++), especially for DAO/DAC and Smart Contracts. Scalability showed uncertainty (0), indicating hesitation to adopt at larger scale without proven examples.

Interpretation:  
 Round 1 established a baseline of promising concepts. DAO/DAC emerged as the strongest contender, particularly for trust, inclusion, and transparency. However, infrastructure readiness and scalability concerns limited confidence.

*Figures:*

* *Figure D.1: Heatmap of Round 1 – Impact on Governance Model*
* *Figure D.2: Heatmap of Round 1 – Key Objectives & Business Impacts*

D.2 Iteration Round 2 – Refinement and Expansion

Ideas Tested:

* + Traditional Governance with DAO integration
  + Blockchain & Circular Economy Dashboards
  + Stakeholder Training for Web3
  + Replacing opaque governance processes
  + Blending blockchain with circular economy metrics
  + Using “Mission Zero” interface as blueprint

Results (Figure D.3):

* Trust & Inclusion: High consensus (++), especially for DAO-based models and removing opaque processes.
* Transparency: Multiple ideas scored very high (++), including dashboards and circular metrics.
* Efficiency & Resilience: Stakeholder training and DAO integration scored strongly (++), showing the importance of human capacity-building alongside technical solutions.
* Innovation Leadership: DAO integration and dashboards were rated as transformative (++).
* Governance Impact: DAO replacement and integration scored high (++ across structure, oversight, and culture). Dashboards and training scored more moderately, with infrastructure challenges (0) persisting.

Interpretation:  
 Round 2 showed that technical systems alone were not enough; stakeholder training and clear transparency mechanisms were critical for adoption. DAO integration plus dashboards offered a strong pathway, but infrastructure and adoption costs were still flagged as weaknesses.

*Figure:*

*Figure D.3: Heatmap of Round 2 – Governance and Business Objectives*

D.3 Iteration Round 3 – Final Selection and Consolidation

Ideas Tested:

* + DAO with Token-based Participating Voting
  + Smart Contract Automation of Decisions
  + Blockchain-based Traceability Systems
  + AI-based Stakeholder Feedback Integration
  + Centralized DAO Dashboard Monitoring
  + Ethical Framework for DAO Governance

Results (Figure D.4):

* Trust & Transparency: DAO token voting, traceability systems, and ethical frameworks all scored maximally (++), signaling consensus around legitimacy and accountability.
* Efficiency & Resilience: Smart contract automation (++), dashboards (++), and traceability systems (++) were highly rated, confirming their potential to reduce bureaucracy and improve resilience.
* Innovation Leadership & Scalability: Blockchain traceability (++), DAO voting (++), and ethical frameworks (++), highlighted Viridis’s potential to position itself as a market leader in sustainable governance.
* Governance Impact: DAO token voting and traceability scored strongly (++ across structure, oversight, culture). AI-based feedback was seen as promising (+) but not yet reliable (0 in some areas).

Interpretation:  
 Round 3 converged towards a hybrid solution:

1. DAO with token voting as the structural foundation.
2. Smart contracts for automation of governance.
3. Blockchain dashboards & traceability logs for transparency.
4. Ethical frameworks and stakeholder training to maintain inclusivity and legitimacy over time.

*Figure:*

* *Figure D.4: Heatmap of Round 3 – Governance and Business Objectives*

D.4 Cross-Round Comparative Insights

1. DAO + Token Voting consistently scored highest, emerging as the backbone of the governance model.
2. Smart contracts and traceability dashboards proved essential enablers for efficiency, transparency, and operational resilience.
3. Stakeholder training and ethical frameworks emerged as necessary social enablers, bridging technology with legitimacy.
4. Infrastructure readiness was a repeated weak point, with several neutral (0) scores across rounds, indicating VIRIDIS must plan a phased rollout with technical reinforcement.
5. Scalability concerns decreased over iterations, as stakeholders grew more confident in the DAO’s ability to integrate with existing operations.

D.5 Final Recommendation from Heatmap Iterations

The heatmap process validated that VIRIDIS’s optimal innovation path lies in a phased, hybrid governance model combining:

* DAO token voting as the structural pillar
* Smart contracts for efficiency and automation
* Blockchain dashboards for real-time transparency
* Ethical frameworks and training to ensure long-term legitimacy

This combination addresses both hard governance structures and soft adoption barriers, aligning directly with Viridis’s mission to attract green-tech investment while maintaining stakeholder trust.

E. Prototype Walkthroughs and Screenshots

E.1 Overview of Prototyping Approach

To validate the proposed DAO-based governance model, low-fidelity and mid-fidelity prototypes were developed and tested in pilot workshops. These prototypes focused on three critical functions:

1. Token-based Voting Flow
2. Blockchain Dashboard Interface
3. Traceability Logs and Transparency Features

The prototypes served as experiential tools for stakeholders to engage with the governance solution, test usability, and provide direct feedback on strengths and shortcomings.

E.2 Token-Based Voting Flow

Walkthrough:

1. Stakeholders log into a secure portal using assigned credentials.
2. Each participant is allocated a fixed number of governance tokens representing their voting rights.
3. A decision proposal (e.g., investment allocation or sustainability target) is displayed.
4. Stakeholders cast votes via a simple “Yes / No / Abstain” interface.
5. The system immediately updates the weighted results and displays them in real time.

Key Features:

* Transparent record of all votes (immutable ledger).
* Equalized participation through capped token allocation.
* Immediate aggregation and visualization of results.

*Screenshot Placeholder:*

*Figure E.1: Prototype Screenshot – Token-Based Voting Screen*

E.3 Blockchain Dashboard Interface

Walkthrough:

1. The main dashboard opens with an overview of current governance decisions, budget allocations, and sustainability KPIs.
2. Modules are color-coded: green (achieved), amber (in progress), red (at risk).
3. Drill-down functions allow users to see specific projects (e.g., solar initiatives, supply chain audits).
4. Real-time updates are logged directly from the blockchain, ensuring data cannot be manipulated.
5. Stakeholders can switch views between financial performance and impact metrics (e.g., CO₂ reductions, stakeholder participation rates).

Key Features:

* Traceability of decision outcomes.
* Clear visualization of financial and impact data.
* Public-facing mode for external transparency.

*Screenshot Placeholder:*

* *Figure E.2: Prototype Screenshot – Blockchain Dashboard Overview*

E.4 Traceability and Transparency Logs

Walkthrough:

1. Every governance decision is automatically linked to a traceability log stored on the blockchain.
2. Logs include:  
   * Proposal origin (who submitted, when).
   * Voting results (with anonymized voter IDs).
   * Implementation status (open, in progress, completed).
3. Logs can be filtered by project, department, or timeframe.
4. Audit functionality allows regulators or external auditors to confirm process integrity.

Key Features:

* Eliminates opaque decision-making.
* Strengthens regulatory compliance and investor confidence.
* Provides permanent, auditable records.

*Screenshot Placeholder:*

* *Figure E.3: Prototype Screenshot – Traceability Log Interface*

E.5 Usability Feedback and Lessons Learned

During pilot testing:

* Direct stakeholders (employees, project managers) found the token-voting flow intuitive, though some requested mobile-first versions.
* Indirect stakeholders (investors, regulators) valued the traceability logs, emphasizing their potential for compliance assurance.
* Concerns were raised regarding over-complexity of dashboard visuals; simplification and customizable views were suggested.

Key insight: prototypes confirmed that the governance model must balance technological sophistication with user accessibility to ensure adoption across stakeholder groups.

E.6 Summary

The prototypes demonstrated proof of concept for DAO-enabled governance at Viridis.

* Voting flow validated inclusivity and transparency.
* Dashboards provided real-time governance performance data.
* Traceability logs addressed compliance and investor trust.

Together, these prototypes reinforced stakeholder confidence in transitioning toward decentralized governance and laid the foundation for further development in the pilot rollout phase.

 F. Risk Tools and Voting Process Design

This appendix documents the frameworks and mechanisms developed for risk identification, mitigation, and governance voting within Viridis’ DAO implementation. It provides a structured overview of tools applied during workshops and final design iterations, alongside the operational blueprint of the voting process.

F.1 Risk Identification and Assessment Tools

The transition from hierarchical governance to a DAO introduces novel risks. To systematically address them, Viridis adopted a multi-layered risk assessment framework:

* SWOT Analysis: Used to compare decentralized vs. traditional governance models, highlighting strengths (e.g., inclusion), weaknesses (e.g., technical complexity), opportunities (e.g., sustainable finance), and threats (e.g., regulatory uncertainty).
* Risk Heatmaps: Categorized risks by likelihood and impact, enabling prioritization of key risks such as low adoption rates, cyber-security breaches, and unclear legal standing.
* Scenario Planning: Tested three futures: optimistic adoption, moderate rollout, and resistance to adoption. Each scenario explored financial, cultural, and regulatory implications (see Section 8.4).
* Mitigation Matrix: Aligned risks with mitigation strategies. For example:  
    
  + *Cybersecurity risk* → Regular smart contract audits.
  + *Adoption risk* → Stakeholder training & onboarding programs.
  + *Regulatory risk* → Continuous compliance monitoring with EU Green Deal updates.

F.2 Voting Process Design

A robust, transparent, and inclusive voting process was central to the DAO governance model. The design followed three principles: fairness, traceability, and scalability.

1. Voting Mechanism

* Token-Based Voting: Each verified stakeholder receives governance tokens proportionate to their role and contribution.
* Quadratic Voting Option: Piloted in workshops to prevent large stakeholders from dominating decision-making.
* Abstain Functionality: Ensures neutrality is registered rather than forcing binary decisions.

2. Voting Flow

1. Proposal Submission – Any verified member may submit a proposal through the dashboard.
2. Proposal Validation – Automatic smart contract check ensures proposals meet predefined criteria (budget range, sustainability fit).
3. Discussion Period – Stakeholders review, debate, and comment before voting opens.
4. Voting Period – Stakeholders vote through the dashboard interface (see Appendix E prototypes).
5. Results Recording – Outcomes are immutably stored on-chain.
6. Implementation Trigger – If approved, smart contracts allocate funds/resources automatically.

3. Oversight Features

* Audit Trail: Every vote and decision logged in blockchain explorer accessible via dashboard.
* Transparency Dashboard: Displays participation rates, results, and decision history.
* Delegated Voting (Proxy Option): Allows stakeholders to assign voting rights temporarily, increasing participation flexibility.

F.3 Risk-Adjusted Voting Enhancements

The voting process integrates risk sensitivity to ensure decisions remain responsible:

* Weighted Voting on High-Risk Proposals: Proposals with higher financial or reputational risks require a supermajority (e.g., 67%) rather than a simple majority.
* Risk Flags: If a proposal exceeds risk thresholds (e.g., legal ambiguity), it is flagged for additional review by a compliance committee before voting proceeds.
* Fail-Safe Mechanism: Smart contracts include emergency stop functions to halt execution if vulnerabilities or governance abuses are detected.

F.4 Testing and Feedback

Pilot workshops validated the process:

* Stakeholders found the token-based system transparent and easy to understand.
* Quadratic voting was appreciated for balancing power, though some participants requested further training.
* Feedback suggested dashboards should integrate tutorials to build confidence in using the system.

Appendix G. Interview Transcripts and Feedback Summaries

This appendix presents the direct stakeholder interviews and feedback collected during GP2. The material is carried into GP3 as evidence for problem identification, solution validation, and stakeholder engagement.

G.1 Direct Stakeholder Interviews

**Interview with Michael Hopf (Project Manager, Business Developer, Viridis)**

**Theme:** Hierarchical processes block fast decision-making.

**Quote:** “It often takes too long for ideas to move through management. Decentralized tools could shorten these cycles.”

**Interview with Christian Verhoef (Lab Leader, Technology and Policy Expert, Viridis)**

**Theme:** Governance innovation is needed to align with systemic sustainability.

**Quote:** “We need structures that bring inclusivity and transparency. DAO concepts could connect policy, technology, and practice.”

**Interview with Jan Philipp Knebel (Research/Reporting, Viridis)**

**Theme:** Reporting requires more transparency and accountability.

**Quote:** “If we had clearer governance records, reporting would become more meaningful for all stakeholders.”

**Interview with Sophia Geissler (Research/Reporting, Viridis)**

**Theme:** Employees need stronger participation channels.

**Quote:** “Our voices are often overlooked in budget and project prioritization. A participatory model would change that.”

G.2 Investor and Financial Stakeholders

**Interview with Hubertus Haller von Hallerstein (Strategic Investor)**

**Theme:** Investors demand accountability and transparent participation.

**Quote:** “Access to governance data without asking is essential—particularly ecological footprint information.”

**Interview with Markus Steiner (Investor)**

**Theme:** Long-term investment requires trust in sustainability goals.

**Quote:** “I am interested in sustainable innovations that prove their long-term viability. Governance clarity helps.”

G.3 Policy and NGO Stakeholders

**Interview with Palaash Gupta (Policy Maker & Sustainability Expert)**

**Theme:** Regulatory alignment is critical to adoption.

**Quote:** “Decentralization has potential, but compliance with ESG rules and GDPR must guide implementation.”

**Interview with NGO Representatives (Climate-focused NGOs)**

**Theme:** Civil society demands transparency and engagement.

**Quote:** “A decentralized model can only succeed if it genuinely includes community perspectives.”

G.4 Workshop Feedback Summaries

**Iteration Round 1 (GP2 Ideation Workshop)**

Employees prioritized faster decision-making.

Investors requested stronger transparency features.

NGOs highlighted inclusivity.

**Quote – Michael Hopf:** “Without decentralization, promising ideas fade out before action.”

**Iteration Round 2**

Heatmap ratings showed DAO governance as the highest-impact solution.

**Quote – Sophia Geissler:** “Finally, a system where input from all levels is visible.”

**Iteration Round 3**

Final selection validated DAO governance with dashboard prototype.

**Quote – Hubertus Haller von Hallerstein:** “Direct voting rights via tokens create accountability for us as investors.”

A screenshot of a computer

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Figure 18 Workshop & Feedback from Trion and Stakeholder ( S.Geissler 2025)

G.5 Synthesis of Interview Evidence

**Transparency and accountability** were demanded by all stakeholder groups.

**Hierarchical bottlenecks** were consistently criticized as slowing innovation.

**DAO-inspired governance** was widely seen as a potential differentiator for Viridis.

**Stepwise, compliance-oriented rollout** was recommended to reduce risk and build trust.

H. Financial Tables and Calculations

This appendix provides the detailed financial breakdowns that support Section 8 of the report. The values are derived from GP2 analysis, scenario planning, and industry benchmarking for DAO implementation in sustainability-focused SMEs.

H.1 Initial Setup Costs (CAPEX)

|  |  |  |  |
| --- | --- | --- | --- |
| Cost Category | Description | Estimated Cost (€) | Source/Notes |
| Platform Development | DAO governance dashboard, token system, voting mechanism | 60,000 | GP3 IT Architecture estimates |
| Blockchain Infrastructure | Node hosting, smart contract deployment | 25,000 | Based on decentralized governance case studies |
| Training & Workshops | Staff onboarding, governance model training | 15,000 | Derived from GP2 workshop cost base |
| Legal & Compliance | External legal advisory for DAO & finance regulations | 20,000 | EU Sustainable Finance compliance reports |
| Pilot Testing (Prototype) | Small-scale rollout, stakeholder testing | 10,000 | GP3 pilot design |
| Total CAPEX |  | 130,000 |  |

H.2 Operational Costs (OPEX, per annum)

|  |  |  |  |
| --- | --- | --- | --- |
| Cost Category | Description | Estimated Annual Cost (€) | Source/Notes |
| Platform Maintenance | Updates, hosting, blockchain validation | 20,000 | GP3 architecture cost model |
| Governance Administration | DAO facilitation, moderation, support staff | 25,000 | GP3 HR projections |
| Compliance & Audit | Ongoing regulatory monitoring, external audits | 15,000 | EU reporting guidelines |
| Communication & Engagement | Community newsletters, workshops, outreach | 10,000 | GP2 workshop base |
| Total OPEX (per annum) |  | 70,000 |  |

H.3 Efficiency Gains and Cost Savings

|  |  |  |  |
| --- | --- | --- | --- |
| Savings Category | Description | Estimated Savings (€) | Source/Notes |
| Faster Decision-Making | Reduced delays, fewer project bottlenecks | 50,000 annually | Based on GP2 operational inefficiencies |
| Reduced Legal Risks | Transparent governance lowers risk of disputes | 25,000 annually | Case comparison, EU Sustainable Finance |
| Lower Transaction Costs | Automated voting & smart contracts | 15,000 annually | Blockchain governance literature |
| Improved Investor Trust | Higher likelihood of capital inflows (indirect) | Qualitative + ROI | Investor interviews, GP2 transcripts |

H.4 Revenue Streams

|  |  |  |  |
| --- | --- | --- | --- |
| Revenue Category | Description | Estimated Annual Revenue (€) | Source/Notes |
| V-GTI Services | Green Tech Investments – DAO-managed fund | 150,000 | GP3 scenario design |
| V-ECO Services | Ecosystem partnerships & compliance services | 100,000 | GP3 revenue model |
| Sponsorship & Grants | Attracted due to innovative governance | 50,000 | EU Innovation Grants |
| Total Annual Revenue |  | 300,000 |  |

H.5 Scenario Analysis – Payback Period

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Scenario | CAPEX (€) | OPEX p.a. (€) | Annual Savings (€) | Annual Revenue (€) | Net Benefit p.a. (€) | Payback Period (Years) |
| Best Case | 130,000 | 70,000 | 90,000 | 300,000 | 320,000 | 0.4 |
| Normal Case | 130,000 | 70,000 | 60,000 | 200,000 | 190,000 | 0.7 |
| Worst Case | 130,000 | 70,000 | 30,000 | 100,000 | 60,000 | 2.2 |

H.6 Calculation Notes

* Payback Period Formula:  
   Payback Period=CAPEXNet Annual Benefit\text{Payback Period} = \frac{\text{CAPEX}}{\text{Net Annual Benefit}}Payback Period=Net Annual BenefitCAPEX​
* Assumptions:  
    
  + DAO platform CAPEX is a one-time investment.
  + OPEX continues annually with potential reductions at scale.
  + Revenue growth from V-GTI and V-ECO services follows a 10% CAGR (conservative estimate).
  + Best Case assumes full adoption by stakeholders and external recognition.
  + Worst Case assumes partial adoption and slower diffusion.

I. EU Sustainable Finance Frameworks (Taxonomy, Green Deal, ESG)

*A graph of blue squares

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Figure 19 Bar chart comparing CAPEX vs OPEX

This chart highlights the one-time investment required for the DAO platform (CAPEX) compared to the recurring annual operational costs (OPEX). The initial capital expenditure of €130,000 is significantly higher than yearly maintenance costs (€70,000), demonstrating that the financial burden is front-loaded and decreases once the system is established.

A graph with a line going up

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Figure 20 A payback curve showing best, normal, and worst-case scenarios

Figure 20 Payback Curve Across Scenarios  
The payback curve illustrates how quickly VIRIDIS can recover its initial investment under different adoption scenarios. In the best case, the payback period is less than half a year due to strong revenues and efficiency gains. The normal case projects a recovery in under one year, while the worst case extends to 2.2 years, still within a reasonable timeframe for innovation investments.