ODDO BHF EURO STABLECOIN (EUROD) MiCA white paper

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Publication date: [27/01/2026]

Foreword

This document was written by **ODDO BHF SCA** ("ODDO BHF") and constitutes the white paper for the public offering of the crypto-asset "ODDO BHF Stablecoin", abbreviated "**EUROD**" (or "**the e-money token**" or "**EMT**") in accordance with the provisions of Article 51 "*Content and form of the crypto-asset white paper for e-money tokens*" and Annex III of EU Regulation 2023/1114 ("**MiCA Regulation**" or "**MiCAR**").

This white paper aims to provide essential information on the characteristics, functions and risks relating to the EUROD for users located in the European Economic Area who are considering acquiring it. This white paper also provides general information about the EUROD regarding the issuer, the offeror and persons seeking admission to trading, the rights and obligations attached to the EUROD, the underlying technology used for the EUROD issuance, and the corresponding risks. However, the white paper does not contain a description of the risks, which are unpredictable and highly unlikely to materialize.

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I. General information

01.	**Notification date**	This white paper was first notified to the ACPR on 2024-06-26 and amended on 2026-01-27.
02.	**Statement in accordance with Article 51(3) of MiCAR**	This crypto-asset white paper has not been approved by any competent authority in any Member State of the European Union. The issuer of the crypto-asset is solely responsible for the content of this crypto-asset white paper.
03.	**Compliance statement in accordance with Article 51(5) of MiCAR**	This crypto-asset white paper complies with Title IV of Regulation (EU) 2023/1114 and to the best of the knowledge of the management body, the information presented in the crypto-asset white paper is fair, clear and not misleading and the crypto-asset white paper makes no omission likely to affect its import.
04.	**Warning in accordance with Article 51(4) of MiCAR**	This e-money token is not covered by the investor compensation schemes under Directive 97/9/EC. This e-money token is not covered by the deposit guarantee schemes under Directive 2014/49/EU.

II. Summary

05.	**Warning in accordance with Article 51(6) of MiCAR**	The summary should be read as an introduction to the crypto-asset white paper. The prospective holder should base any decision to purchase the e-money token on the content of the crypto-asset white paper as a whole and not on the summary alone. The offer to the public of the crypto-asset does not constitute an offer or solicitation to purchase financial instruments and that any such offer or solicitation can be made only by means of a prospectus or other offer documents pursuant to the applicable national law. The crypto-asset white paper does not constitute a prospectus as referred to in Regulation (EU) 2017/1129 of the European Parliament and of the Council or any other offer document pursuant to Union or national law.
06.	**Characteristics of the crypto-asset**	**Nature of the token and issuer**. EUROD is an EMT within the meaning of Article 3(7) of MiCAR issued by ODDO BHF since 2025.

		Nature of the underlying. Designed to transfer crypto-assets quickly, worldwide and without risk of volatility, EUROD is a token that aims to maintain a stable value against the euro currency (EUR, €). **EUROD collateralisation**. ODDO BHF maintains a collateral value in euros equivalent to at least the number of EUROD issued. The funds received in exchange for the issuance of EUROD are recorded on the balance sheet of ODDO BHF and form part of the Bank's general assets. As a result, EUROD does not rely on a segregated reserve mechanism as required for stablecoins issued by electronic money institutions. In accordance with MiCAR, a proportion of the funds received in consideration for the issuance of EUROD (which may not exceed 70% of the total value of the total circulating supply) are invested in highly liquid financial instruments with minimal market risk, credit risk and concentration risk. The composition of EUROD's collateralisation can be consulted in at any time on our website: https://www.oddo-bhf.com/fr **Minimum unit**. The unit of account EUROD is divisible up to 1,000,000,000,000,000,000 parts (18 decimals) of EUROD and the global offer of tokens in circulation depends on the number of tokens minted at ODDO BHF. **Technical characteristics**. The EUROD token is issued on the Polygon PoS blockchain. It is based on the ERC-20 standard. It can be traded or purchased on the websites of selected crypto-asset service providers that have admitted it to trading or otherwise provide services in relation to EUROD.
07.	**Right of redemption**	EUROD holders have a right of redemption at any time and at par value. Each EUROD can be redeemed by ODDO BHF for one (1) euro. In principle, this right of redemption is not limited by any threshold and is not subject to any fees. Each redemption request can be made through the ODDO BHF back office (contact: eurod@oddo-bhf.com) once the EUROD holder has successfully passed the identification and identity verification measures put in place by ODDO BHF to meet its anti-money laundering and terrorist financing ("**AML/FT**") obligations. Once the EUROD holder has been identified, the right to redemption can be exercised by applying the following procedure: The EUROD holder makes a request by email to redeem stablecoins directly with ODDO BHF. ODDO BHF proceeds to the assessment of the origin of the stablecoins. The EUROD holder transfers its tokens to ODDO BHF wallet address.

ODDO BHF Back-Office team confirms they receive the token on ODDO BHF 's wallet.
There will be two daily cut-offs at 10:00am CET and 4:30pm CET available every workday of French banks. Any redemption request received is handled by ODDO BHF after the next cut-off.
If confirmation is received before one of the two cut-off times, then ODDO BHF Back-Office team burns the token on the same day and transfers after the cut off time the equivalent amount of cash from ODDO BHF's bank account to the EUROD holder's bank account (IBAN checked during whitelisting process)
If confirmation is received after the last cut off the day (at 4:30pm CET), ODDO BHF Back-Office team burns the token and orders cash payment on the next day after the first cut-off time.
The EUROD holder receives cash on its bank account.

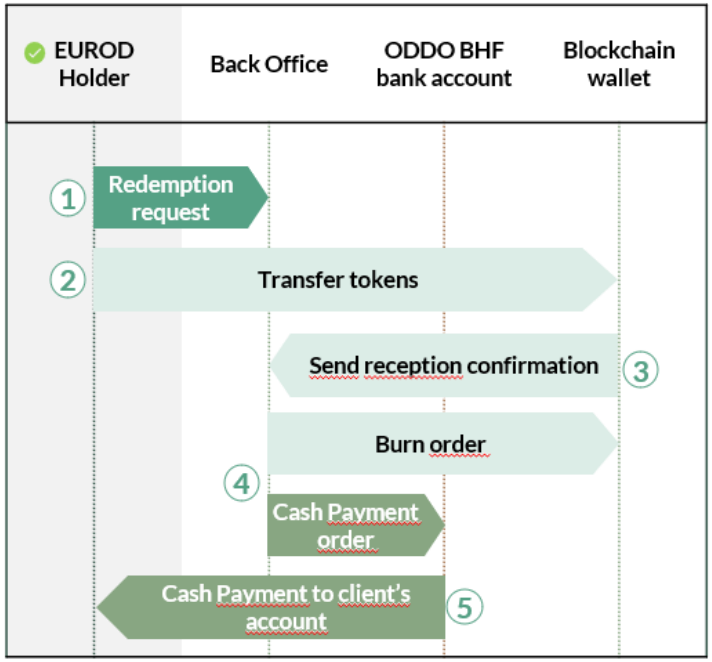

Figure 1: Simplified illustration of the redemption procedure for EUROD holders

In addition to the right of redemption conferred to EUROD holders directly by ODDO BHF, EUROD holders also have the option of selling their tokens to third parties (and notably crypto-asset service providers) in exchange for legal currency. ODDO BHF may enter into contractual arrangements with selected crypto-

		asset service providers in order to determine the scope of these partnerships. Please note that, from a legal perspective, the sale of EUROD to such third party does not equate to a redemption.
08.	**Key information about the offer and or admission to trading**	EUROD is offered to the public by ODDO BHF. It may be offered or admitted to trading by several third-party crypto-asset service providers. The public offering or admission to trading of EUROD requires the express consent of ODDO BHF. For any such request, please contact the relevant ODDO BHF department at the following address: eurod@oddo-bhf.com For the public offering or admission to trading of EUROD by a company established in the European Economic Union, ODDO BHF ensures that such company complies with the requirements of MiCAR, insofar as the provisions of MiCAR are applicable to that company at the time of the offering or admission to trading.

Part A. Information about the issuer of the e-money token

A.1	**Statutory name**	ODDO BHF SCA
A.2	**Trading name**	ODDO BHF
A.3	**Legal Form**	General Partnership limited by shares ('Société en commandite par actions')
A.4	**Registered address**	Registry of commercial court of Paris The registered address is the same as the head office address
A.5	**Head office**	12, bd de la Madeleine, 75009, Paris, France
A.6	**Registration date**	09 June 1965
A.7	**Legal entity identifier**	969500I9DJHZ3449O66
A.8	**Other identifier required pursuant to applicable law**	n/a
A.9	**Contact telephone number**	+ 33 1 44 51 85 00 (French phone number, at local call rate and no premium-rate)
A.10	**Email address**	eurod@oddo-bhf.com
A.11	**Response Time (days)**	From 2 to 5 working days

A.12	**Parent Company**	Financière IDAT, simplified joint-stock company (Société par actions simplifiée) Registered at the Registry of commercial court of Paris under the number 402 556 716
A.13	**Management**	• Philippe Oddo, General partner & CEO • Grégoire Charbit, Global CEO of Commodities and International & Corporate Banking and Asset Servicing • Benoit Claveranne, Global Chief Transformation & Development Officer • Joachim Häger, Global CEO of ODDO BHF Private Wealth Management • Christophe Tadié, Global CEO of ODDO BHF Corporates & Markets Business address: 12, bd de la Madeleine, 75009, Paris, France
A.14	**Business Activity**	Exercise and development of all activities related to investment services, insurance brokerage activities, administrative and accounts management
A.15	**Parent Company Business Activity**	Financière IDAT: Researching, acquiring, holding, managing and selling all securities and all other investments securities
A.16	**Conflict of Interest Disclosure**	As a credit institution active in the crypto-assets sector, ODDO BHF has interests in third parties that play an important role in this sector. To date, the main conflicts of interest that could affect ODDO BHF's EUROD issuance activities concern the relationship with Coinhouse. ODDO BHF is a shareholder of Coinhouse, which is a crypto-assets service provider registered at the French level by the Autorité des Marchés Financiers. Coinhouse will participate in the development of EUROD as it will provide services on EUROD to its customers. Consequently, the main conflicts of interest identified and likely to affect in whole or in part the interests of EUROD holders are the following: A situation in which ODDO BHF would give preference to a third-party over another person to handle an EMT redemption request; A situation in which ODDO BHF would consider existing economic and financial relationships, or close personal relationships with the managers or employees of a third party, in its choice of service providers; ODDO BHF uses the information it has on EUROD holders to enable a third party to develop new products which may not be in the best interest of EUROD holders, but which aim to maximize profits for this third party; A third party holds confidential information on ODDO BHF's financial situation which it uses or communicates externally in the interests of its own customers.

<table>
<tr><td></td><td></td><td>For its banking activities, ODDO BHF already has a policy for managing conflicts of interest, which will also be applied to the issuance of EUROD. In any circumstances, ODDO BHF will work on a daily basis to limit any actual or potential conflicts of interest that may arise regarding the EUROD.</td></tr>
<tr><td>A.17</td><td>Issuance of other crypto-assets</td><td>No</td></tr>
<tr><td>A.18</td><td>Activities related to other crypto-assets</td><td>No</td></tr>
<tr><td>A.19</td><td>Connection between the issuer and the entity running the DLT</td><td>No</td></tr>
<tr><td>A.20</td><td>Description of the connection between the issuer and the entity running the DLT</td><td>N/A</td></tr>
<tr><td>A.21</td><td>Newly Established</td><td>No, ODDO BHF is a family-owned business created in 1849, spanning five generations of stockbrokers.</td></tr>
<tr><td>A.22</td><td>Financial condition over the past three years</td><td>The summary table below shows ODDO BHF's performance over the previous three years.

<table>
<tr><th></th><th>2023</th><th>2022</th><th>2021</th></tr>
<tr><td>Net Banking Income</td><td>€ 806 m</td><td>€ 727 m</td><td>€ 781 m</td></tr>
<tr><td>Total Equity Attributable to Owners of the Parent</td><td>€ 1,211 m</td><td>€ 1,139 m</td><td>€ 1,135 m</td></tr>
<tr><td>Solvency Ratio (total capital)</td><td>21.8%</td><td>17.3%</td><td>15.1%</td></tr>
<tr><td>Fitch Ratings</td><td>BBB+</td><td>BBB+</td><td>BBB+</td></tr>
<tr><td>Client Assets</td><td>€ 140 bn</td><td>€ 128 bn</td><td>€ 142 bn</td></tr>
</table>

In 2023
In a global context of uncertainty, the Group achieved a satisfactory performance, with a total revenue of €806M, representing an evolution of +10.9% compared with 2022. These results once again demonstrate the relevance of the choices that have led us to maintain the balance and complementarities between our three core businesses: asset management, private banking, and investment banking.
The main events influencing the financial results in 2023 include:
• Decreasing inflation, but stable high interest rates impacting Oddo BHF’s activities.</td></tr>
</table>

		• Opening office in London to develop its investment banking and asset management businesses from the UK. • Signing of a partnership agreement in the areas of equity sales and equity research for Austria and CEE with Raiffeisen in Austria. Key performance indicators (KPI) for our three core businesses for this period include: 1. **Private Wealth Management**: €60BN assets under management. 2. **Asset management**: €58BN assets under management, including: a. Private Assets: €3.8BN of committed capital (private equity & private debt). b. Independent financial advisors: €7.6BN assets under management. 3. **Corporate & Markets,** including: a. Fixed income research & brokerage: €18BN traded volume. b. International Banking: 70+ country and product experts and 9% market share in the letters of credit business in Germany. **In 2022** In a difficult geopolitical and market context, the teams maintained a good level of profitability. ODDO BHF reported in 2022 a total revenue of €727M, representing an evolution of –7.4% compared with 2021. The main events influencing the financial results in 2022 include : • Beginning of the war between Ukraine and Russia and energy crisis contributing to high inflation in the eurozone. • Rising interest rates and economic growth slowdown, impacting Oddo BHF's activities (namely the asset management business). • Acquisition of 100% of the capital of Quilvest Banque Privée S.A, renamed La Banque Privée Saint-Germain. ODDO BHF Group strengthens its position in Private Wealth Management, a segment in which ODDO BHF intends to continue to grow significantly in France and Europe. Key performance indicators (KPI) for our three core businesses for this period include : 1. **Private Wealth Management**: €53BN assets under management. 2. **Asset management**: €54BN assets under management a. Private Assets: €3.6BN of committed capital (private equity & private debt). b. Independent financial advisors: €7.5BN assets under management. 3. **Corporate & Markets,** including:

a. Fixed income research & brokerage: €19BN traded volume.
b. International Banking: 70+ country and product experts, 7% market share in the letters of credit business in Germany.

In 2021

The excellent performance of our teams and all our businesses in 2021 is reflected very positively in the Group's figures. Oddo BHF reported in 2021 a total revenue of €781M, representing an evolution of +33.5% compared with 2020.

The main events influencing the financial results in 2021 include :

- Low interest rates, return of inflation, and a weak economic recovery in Europe after the 2020 global crisis.
- Signing a partnership agreement for the with Commerzbank for equity research & brokerage in Germany. The alliance with Commerzbank will enable ODDO BHF to significantly strengthen its expertise in the German market by doubling the number of securities covered in this market.
- Acquisition of Métropole Gestion : the expertise of Métropole Gestion's team will enrich ODDO BHF asset management's existing product offering.

Key performance indicators (KPI) for our three core businesses for this period include :

1. **Private Wealth Management**: €53BN assets under management.
2. **Asset management**: €62BN assets under management
   a. Private Assets: €3BN of committed capital (private equity & private debt).
   b. Independent financial advisors: €7.5BN assets under management.
3. **Corporate & Markets,** including:
   a. Equity Research & Brokerage: N° 1 overall broker in France and in Germany.
   b. Fixed income research & brokerage: €20BN traded volume.
   c. International Banking: 60+ country and product experts and 7,75% market share in the letters of credit business in Germany.

The key financial information regarding the ODDO BHF's balance sheet are:

	31/12/2023	**31/12/2022**	**31/12/2021**
Total Assets	€ 12,426 m	€ 12,722 m	€ 10,972 m

		Total Equity Attributable to Owners of the Parent	€ 1,211 m	€ 1,139 m	€ 1,135 m
		Total Consolidated Equity	€ 1,227 m	€ 1,155 m	€ 1,150 m
		Total Financial Liabilities	€ 11,198 m	€ 11,567 m	€ 9,822 m
		Liquidity Coverage Ratio (LCR)	208%	208%	176%
		Solvency Ratio (CET1)	18.8%	17.2%	15.0%
		Solvency Ratio (Total Capital)	21.8%	17.3%	15.1%
A.23	**Financial condition since registration**	N/A			
A.24	**Exemption from authorization**	No			
A.25	**Asset Token Authorization**	Being licensed as a credit institution, ODDO BHF is authorized to make an offer to the public and seek the admission to trading of an e-money token.			
A.26	**Authorization Authority**	The French supervisory authority : ACPR - *Autorité de Contrôle Prudentiel et de Résolution*			
A.27	**Persons other than the issuer offering to the public or seeking admission to trading of the EMT**	ODDO BHF will work exclusively with some selected trading platform of crypto-assets and so-called "Brokers" providing notably the exchange of crypto-assets for funds and the exchange of crypto-assets for other crypto-assets services. These platforms will be regulated in the European Union – either as crypto-asset service providers in accordance with MiCAR (when MiCAR's dispositions become applicable) or, before the end of MiCAR's transition period, as digital/virtual asset service providers in accordance with their national law. The list of entities admitting EUROD to trading or offering EUROD to the public and which have obtained the express consent of ODDO BHF to do so is available on our website: *https://www.oddo-bhf.com/eurod-stablecoin/*			
A.28	**Reason for offering to the public or seeking admission to trading of the EMT by persons referred to in Article 51(1), second subparagraph of MiCAR**	N/A			

Part B. Information about the e-money token

B.1	**Name of the e-money token**	EUROD
B.2	**Abbreviation of the e-money token**	EUROD
B.3	**Details of all natural or legal persons involved in the implementation of the crypto-asset project**	Fireblocks – token generation provider Morgan, Lewis & Bockius LLP – legal advisor Lamarck Solutions – Sustainability intelligence provider and advisor ODDO BHF Asset Management: Collateral manager
B.4	**Type of white paper**	EMTW - Electronic-Money Token White Paper Based on the ESMA Template for white papers for e-money tokens published on October 2025
B.5	**Type of submission**	MODI
B.6	**E-money token Characteristics**	EUROD is defined as an e-money token pursuant to Article 3.1(7) of MiCA. As of the date of this White Paper, EUROD does not constitute a "significant e-money token" as defined by Article 56 of MiCA. EUROD is a token pegged to the EUR and issued by ODDO BHF SCA. EUROD is backed by full balance sheet of ODDO BHF SCA. The stability of EUROD relies on ODDO BHF SCA's compliance with applicable capital, liquidity and prudential requirements and on its supervision as credit institution by the ACPR.
B.7	**Website of the issuer**	https://www.oddo-bhf.com/

B.8	**Starting date of offer to the public of admission to trading**	October 15th, 2025
B.9	**Publication date**	This white paper was first notified to the ACPR on 2024-06-26 and amended on 2026-01-27.
B.10	**Any other services provided by the issuer**	Not Applicable
B.11	**Language or languages of the white paper**	English
B.12	**Digital token identifier code used to uniquely identify the crypto-asset or each of the several crypto assets to which the white paper relates, where available**	The token is registered on the Digital Token Identifier Foundation registry under the Digital Token Identifier H1LDKQR5B.
B.13	**Functionally fungible group digital token identifier, where available**	WJV6THJ2D
B.14	**Personal data flag**	Yes

B.15	**LEI eligibility**	True
B.16	**Home member state**	France (FR)
B.17	**Host member states**	Belgium (BE), Bulgaria (BG), Czechia (CZ), Denmark (DK), Germany (DE), Estonia (EE), Ireland (IE), Greece (EL), Spain (ES), Croatia (HR), Italy (IT), Cyprus (CY), Latvia (LV), Lithuania (LT), Luxembourg (LU), Hungary (HU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Slovenia (SI), Slovakia (SK), Finland (FI), Sweden (SE), Iceland (IS), Liechtenstein (LI), Norway (NO).

Part C. Information about the offer to the public of the e-money token or its admission to trading

C.1	**Public Offering or Trading**	'OTPC' – offer to the public
C.2	**Number of units**	The number of units of EUROD is not limited to any fixed amount within its smart contract. There is no limitation of the number of EUROD that can be offered to the public or admitted to trading. The total number of EUROD issued depends on and will depend on the market demand. As of January 27th, 2026, EUROD has an outstanding supply of 5,1 million EUROD.
C.3	**Trading Platforms**	As of January 27th, 2026, EUROD is available on the Spanish crypto exchange Bit2me. In the future, ODDO BHF will work exclusively with some selected crypto-assets service providers. These providers will be regulated in the European Union – either as crypto-asset service providers in accordance with MiCAR (when MiCAR's dispositions become applicable) or, before the end of MiCAR's transition period, as digital/virtual asset service providers in accordance with their national law.

		As of the date of this white paper, ODDO BHF has applied for an admission to trading on the main European trading platforms.
C.4	**Trading Platforms Market Identifier Code (MIC)**	Not Applicable
C.5	**Applicable law**	France
C.6	**Competent court**	Courts of Paris

Part D. Information on the rights and obligations attached to e-money tokens

D.1	**Holder's rights and Obligations**	**Holders of EUROD tokens are not entitled to any rights other than those provided for in the regulation applicable to electronic money tokens and specified in this white paper**. In this sense, holding EUROD tokens only confers on the holder a redemption right (as presented in section 07) and does not grant any right to receive interest from ODDO BHF or any crypto-asset service provider in relation to the holding of EUROD. As specified in section I.07, the redemption right will be satisfied by ODDO BHF at any time (subject to the cut-off times) and at par value. However, holders of EUROD should note that this right is not unconditional and requires EUROD holders to comply with AML/FT due diligence measures to be carried out by ODDO BHF, in accordance with the applicable legislation. In any event, by holding or using EUROD, EUROD holders represent and warrant that: • They hold and use EUROD in accordance with this white paper and applicable laws; • They are at least 18 years of age; • They are not a Restricted Person (as this term is defined below), and do not hold EUROD on behalf of a restricted person; • They reside in a country that is a member of the European Union or the European Economic Area, or they reside in Switzerland or in the United Kingdom; • They will not use EUROD for any illegal activity, including, but not limited to, illegal gambling, money laundering, fraud, blackmail, extortion, ransomware, terrorism financing, other violent activities, or any prohibited market practice; • Ans they do not and will not use mixers or other anonymization tools to obfuscate the origin of the EUROD, when the EUROD are transferred on the blockchain.

		For the purpose of this section, "Restricted Person" means (i) any natural or legal United States person, (ii) any person that is subject to sanction or asset freezing measures based on the lists published by the French Ministry of Economics and Finance, the United Nations, the European Union, and/or the U.S. Office of Foreign Assets Control, and (iii) person that controls a blockchain address that is sanctioned by the U.S. Office of Foreign Assets Control. EUROD may not be offered or sold within the United States or to, or for the account or benefit of, U.S. persons. Holders of EUROD are hereby informed that the smart contract used for the issuance of EUROD includes the following technical features: pause or unpause the EUROD for certain categories of investors, i.e. buying new tokens will be impossible for these categories, but they will be allowed to hold and sell existing tokens; freeze the EUROD held by a specific blockchain address, *i.*e. preventing that address from transferring the EUROD to another address; force the transfer of the EUROD held by a specific blockchain address to another address. ODDO BHF shall monitor the use and circulation of EUROD on the blockchain. Where ODDO BHF's compliance department considers, at its sole discretion, that a blockchain address may be associated with an illegal activity or an activity that otherwise breaches the obligations of EUROD holders (as defined in this white paper), ODDO BHF may use the technical features described above. In any event, ODDO BHF may use any of these features in order to comply with a lawful request from a competent authority. **Ability of ODDO BHF to cease the issuance of EUROD** As part of its evolving activities, ODDO BHF may, at its own discretion, decide to cease the issuance of EUROD, subject to a prior notification of such decision to the ACPR. The implementation of this cessation may affect the rights of EUROD holders in the following ways: • Concerning the issuance of new EUROD: upon activation of its cessation plan, ODDO BHF will no longer allow its clients to request the creation of new EUROD.

		• Concerning the exercise of the right to redemption, ODDO BHF will give sufficient notice (at least two months) allowing EUROD holders to request redemption directly from ODDO BHF. During this notice period, ODDO BHF will ensure that a service provider can take over ODDO BHF's business at the end of the notice period to process the remaining redemption requests. • During the notice period, EUROD holders will still be able to sell their EUROD to third parties, including crypto-asset service providers which have entered a partnership with ODDO BHF. **The cessation of the issuance will not affect the safeguarding of the funds received in exchange for EUROD.** EUROD will remain fully collateralized, in accordance with the provision of MiCAR, until the complete redemption of the outstanding EUROD.
D.2	**Rights and obligations modification**	The rights and obligations of EUROD holders may change, either following regulatory developments or at ODDO BHF's discretion. In any case, **any modification (significant or not) of these rights and obligations will require a prior notification of EUROD holders** by way of a modification of this white paper, in accordance with the provisions of MiCAR. In addition, ODDO BHF will use various communication channels (such as email, posts on social networks, etc.) to inform the holders about the contemplated modification.
D.3	**Description of the rights of the holders**	**Right of redemption.** Holders of EUROD have a redemption right equivalent in euro (€) to the total number of EUROD held. For more information on the redemption right of EUROD holders, please refer to section I.07 of this white paper. **Ability to sell.** In addition to the right of redemption, EUROD holders who are already verified with a crypto-asset service provider that has entered a partnership with ODDO BHF may sell their EUROD directly to that provider. This procedure does not constitute a redemption. EUROD may also be sold or transferred to any counterparty who is not a Restricted Person or used as a mean of payment in a transaction with such person. **Rights in case of insolvency**. The unlikely event of ODDO BHF's insolvency should not prevent the right to redemption of EUROD holders. ODDO BHF has put in place procedures to prevent any impact on its activities under different scenarios, including the issuance of EUROD, and on the rights of token holders. If ODDO BHF is unable to meet its obligations regarding the right of redemption, EUROD holders' claims against ODDO BHF are duly protected in accordance with the applicable laws in France and the provisions of the MiCA Regulation.

		Consequently, if ODDO BHF were to become insolvent, holders would still have a redemption right, proportional to the total value of the funds received in exchange for the issuance of EUROD and safeguarded in accordance with the provisions of MiCAR.
D.4	**Rights in implementation of recovery plan**	If ODDO BHF encounters major issues that prevent it from complying with the requirements applicable to the issuance of the EUROD, the measures set out in its recovery plan will be implemented. This recovery plan will be notified to the competent authority within six months of the date of the offer to the public or admission to trading of EUROD. In this respect, **the implementation of the recovery plan by ODDO BHF could affect the rights of EUROD holders**. This includes, but is not limited to, the following measures: limiting the amount of EUROD that can be redeemed each business day (either globally or at the level of individual EUROD holders); charging a redemption fee on EUROD redemption; and temporarily suspending redemption operations. The implementation of these recovery options will be strictly defined in terms of duration and thresholds.
D.5	**Rights in implementation of redemption plan**	In accordance with MiCAR and ODDO BHF's risk appetite, the implementation of these recovery options will be strictly defined in terms of timing and thresholds. ODDO BHF will notify a redemption plan to its competent authority within six months of the date of the offer to the public or admission to trading. This redemption plan will lay down all actions and processes that will be taken ODDO BHF if the competent authority takes the decision to activate the redemption plan. All these processes will be established with a view of ensuring an equitable treatment of all holders and the protection of the right of redemption attached to EUROD as described above. When the competent authority launches the redemption plan, ODDO BHF will start the organized planning of the different phases of the redemption plan necessary to achieve the orderly redemption of all token holders in an equitable manner.

		As part of this process, a communication notice will be published, informing all EUROD holders about the process and timelines to submit their redemption claim. Holders will need to provide some minimum information related to their identity, their token holdings, AML/CFT compliance, their bank account details and potentially additional information to file their redemption claim. The public communication notice that will inform token holders of the activation of the redemption plan will be shared across various communication channels (e-mail, app-push, public communication, etc.). It will describe the main steps of the redemption process in greater detail, including the exact date and time when the redemption plan has been activated, the minimum information necessary to file a redemption claim, the timeframe, as of the publication of such notice, within which the token holders are required to file their redemption claim, and the modality, technical support and location where the token holders should file their redemption claim. However, in the event of ODDO BHF bankruptcy, holders of EUROD will be refunded at the end of the communication period by the appointed administrator, without having to file any declaration of claim, in accordance with applicable law – but subject to completing the AML/FT verifications. If ODDO BHF is unable to refund holders of EUROD at par value, their redemption right will be proportional to the value of the funds received in exchange for the issuance of EUROD and safeguarded in accordance with the provisions of MiCAR. The redemption right for EUROD holders is protected by the applicable law.
D.6	**Complaint Submission Contact**	ODDO BHF has published, in clear, comprehensible language, the procedures for referring complaints to each level of complaint handling, the processing times and, where applicable, the contact details of the relevant mediators. The complaints handling procedure can be consulted on the ODDO BHF website: https://www.oddo-bhf.com/legal-notices/
D.7	**Complaints Handling Procedures**	Any ODDO BHF employee who receives a complaint from a client or potential client by email, post or telephone call (or who must pass on to the relevant contact person or department written complaints which he/she is not authorized to handle): a) Acknowledge receipt of the complaint within a maximum of ten (10) working days from the date on which the complaint was sent, unless the response itself is provided to the customer within this period.

		The acknowledgement of receipt must mention the ODDO BHF web page which sets out the customer complaints processhttps://www.oddo-bhf.com/legal-notices/. b) Processes and responds to the complaint within a maximum of two (2) months from the date of dispatch of the first written notification (the postmark will be taken as proof of the date of dispatch for complaints received by post). Failing this, an email or letter should be sent to the customer if the deadline is not met due to the occurrence of particular circumstances; Case 1: We agree to respond to the customer's request and proceed with any compensation in accordance with the terms of the claim; Case 2: We refuse to meet the customer's request in full or in part, in which case our response must be accompanied by the following statement.
D.8	**Dispute Resolution Mechanism**	Any dispute, controversy or claim arising from ODDO BHF's issuance of the EUROD must first be resolved through discussion between the parties to the dispute. In a dispute, the parties will first meet to attempt in good faith to negotiate a resolution of the dispute before using other remedies available. Discussions and correspondence relating to the attempted resolution of any such dispute will be treated as confidential. If the dispute cannot be resolved following this attempt to reach a compromise, EUROD holders who act as consumers may contact, free of charge, either the mediator at the Fédération Bancaire Française, by submitting your complaint on the website http://lemediateur.fbf.fr website ("access the form" tab) or by post to Monsieur le Médiateur - CS 151 - 75422 PARIS Cedex 9, or to the mediator of the Autorité des Marchés Financiers, by electronic form accessible on the AMF website, https://www.amf-france.org/fr/le-mediateur/presentation (> Saisir le médiateur) or by post to Madame la Médiatrice - 17 place de la Bourse - 75082 Paris Cedex 2. The choice thus made for one or other of the mediation services will be definitive for the corresponding claim. Requests for mediation must be made after an attempt has been made to resolve the dispute directly between the two parties.
D.9	**Token Value Protection Schemes**	EUROD is issued by ODDO BHF as a credit institution. The funds received in consideration for the issuance of EUROD are recorded on ODDO BHF's balance sheet and form part of the Bank's general assets. Accordingly, EUROD holders have a claim against ODDO BHF as issuer, equivalent to the nominal value of

		the EUROD held, and benefit from the regulatory and prudential framework applicable to credit institutions, including capital, liquidity and risk management requirements. ODDO BHF manages its balance sheet and liquidity position in a manner intended to ensure the redemption of EUROD at par value at any time. During the initial phase of issuance, the Bank applies a conservative liquidity management policy and maintains a high level of liquid assets to meet expected redemption flows. In the event of enforcement or insolvency proceedings affecting ODDO BHF, EUROD holders would rank as unsecured creditors of the Bank, pari passu with other unsecured creditors, subject to applicable banking and insolvency laws..
D.10	**Applicable law**	France
D.11	**Competent court**	Courts of Paris

Part E. Information on the underlying technology

E.1	**Distributed ledger technology**	The project will use Polygon Proof of Stake, which is an Ethereum Virtual Machine (EVM) based blockchain like Ethereum.
E.2	**Protocols and technical standards**	The project will leverage the ERC-20F standard for holding, storing and transferring value. The ERC-20F is part of Fireblocks' suite of reference smart contracts and use the reference protocols ERC20 standard from Ethereum. The ERC20F can be used as a unit of account for the ecosystem of the institution's smart contracts. Included in the smart contracts are a set of battle hardened, configurable, opinionated features, such as RBAC (Role-Based Access Control), Pause controls, and Contract URI (that might contain a link to terms and conditions).

E.3	**Technology Used**	Polygon will be used as the public blockchain to deploy the smart contract for the stablecoin. The infrastructure used will be Fireblocks. Fireblocks will be used to give ODDO BHF governance around deploying the smart contract and managing both mint and burn operations. Fireblocks will also be used to create wallets to hold the tokens by the ODDO BHF operations team. An allowlist smart contract will also be deployed to allow the ODDO BHF team to manage which wallets can hold the token. Furthermore, Fireblocks ERC20F smart contract has Role Based Access Controls (RBAC) which the ODDO BHF team will use to implement governance at the smart contract level. This will work hand in hand with Fireblocks Transaction Authorization Policy (TAP) which will manage off-chain governance, such as any checks or compliance processes that detail how operations teams can interact with the tokens.
E.4	**Purchaser's technical requirements**	Any Polygon wallet can hold EUROD tokens, provided that its wallet address is not blacklisted by ODDO BHF, in compliance with, but not restricted to, OFAC Sanctioned Digital Currency Addresses and Chainanalysis blacklists. This applies to both Cryptocurrency Exchange wallets and third-party wallets.
E.5	**Consensus Mechanism**	For Polygon PoS, the consensus mechanism will be Proof of Stake
E.6	**Incentive Mechanisms and Applicable Fees**	As for any other tokens based on this blockchain, the transfer of EUROD on the Polygon Proof of Stake blockchain requires the payment of network fees (also named "transaction fees" or "gas fees") to the validators of the blockchain. These validators will include the transaction transferring the EUROD in a new block, thereby updating the "state" of the blockchain and permanently transferring the EUROD to the beneficiary address. These network fees are <u>not</u> received by, nor shared with, ODDO BHF.
E.7	**Use of Distributed Ledger Technology**	This does not apply as Polygon is a public blockchain. DLT not operated by the issuer or a third-party acting on the issuer's behalf.
E.8	**DLT Functionality Description**	This does not apply as Polygon is a public blockchain. Polygon is a public blockchain built on the Ethereum Virtual Machine (EVM) standard, connected with the Ethereum Mainnet. Polygon was launched to provide additional flexibility, scalability and lower fees when compared to Ethereum mainnet. Polygon is a popular choice for a chain as by using the EVM it provides the same composability as Ethereum.

E.9	**Audit**	The ERC20F Smart Contract was audited by Open Zeppelin.
E.10	**Audit outcome**	The findings of the audit were: 0 Critical issues 0 High severity issues 0 Medium severity issues 1 Low severity (partially resolved)

Part F. Information on the risks

F.1	**Issuer-Related Risks**	AAs part of the EUROD issuing process, ODDO BHF is exposed to several risks: 1. **Bankruptcy Risks.** This is the risk of ODDO BHF going bankrupt, which could result from the insolvency of ODDO BHF as part of its activities, or in the event of the failure of a systemic bank, leading to other bankruptcies in the banking sector, including that of ODDO BHF. 2. **Third-party Risks.** This is the risk ODDO BHF faces in its business relationships with one or more third parties. In particular, this risk covers the bankruptcy of one or several crypto-asset service providers that have entered into a partnership with ODDO BHF. Since these providers facilitate the secondary market of EUROD (notably its direct sale), their bankruptcy could force EUROD holders to use other ways to sell their EUROD, including its direct redemption with ODDO BHF. 3. **Market Risks.** In the event of a high volatility of the crypto-asset markets, ODDO BHF may receive a large number of redemption requests and may not be able to fulfill all these requests within the appropriate timeframe. 4. **Risk of Loss.** This is the risk of loss caused by fraud, theft, misuse, negligence or improper administration of the EUROD.

		5. **AML/CFT Risks.** This is the risk that crypto-asset wallets holding EUROD or transactions in EUROD may be used for money laundering or terrorist financing purposes or identified to a person known to have committed such offences. 6. **Personal Data Risks.** This is the risk that the personal data of ODDO BHF customers may be leaked or stolen due to a security breach.
F.2	**Token-Related Risks**	The EUROD token also exposes its holder to several risks: 1. **Financial stability risks.** This is the risk whereby EUROD, if it becomes widely used and integrated by financial intermediaries and market infrastructures, could be seen as systemic, and as such be subject to additional requirements and restrictions. 2. **"Depeg" risk**. This is the risk that the market value of EUROD on the secondary market falls below €1, thereby disrupting the activities of actors that use EUROD for their payments or purchases. 3. **Liquidity Risks.** This is the risk that ODDO BHF may not have sufficient funds in its balance to meet its obligations to refund EUROD holders, or that, due to an exceptionally high demand for redemption, ODDO BHF may not be able to redeem EUROD at any time at par value. 4. **Scam Risks.** This is the risk of loss resulting from a scam or fraud suffered by EUROD holders from other malicious users. These scams include – but are not limited to – phishing on social networks or by email, fake giveaways leading to scams, identity usurpation of ODDO BHF or its executive members, creation of a fake EUROD token, offering fake EUROD airdrops, etc. 5. **Taxation Risks.** The taxation regime that applies to purchases and sales of EUROD by natural or legal persons will depend on each holder's jurisdiction. ODDO BHF cannot guarantee that conversions of legal currency against EUROD, or conversions of other crypto-assets against EUROD, will not incur tax consequences. In addition, holders of EUROD should be warned that, based on the provisions of MiCAR, EUROD could qualify as either (or both) a crypto-asset or electronic money. That legal qualification will likely impact the tax treatment of EUROD transactions.

F.3	**Technology-Related Risks**	In addition to personal and financial risks, EUROD holders are also exposed to technological risks: 1. **Risks related to the Distributed ledger technology.** This is the risk of the DLT network contain technical vulnerabilities, which would expose the DLT to attacks that could lead to general network disruptions, such as unexpected stoppages in block production, major losses for network participants or unexpected liquidity movements. 2. **Smart contract risks.** This is the risk that the smart contracts deployed by ODDO BHF to mint or burn EUROD on the Polygon network or to ensure the transfer of EUROD (notably to other chains) may be exposed to technical vulnerabilities that could lead to losses for EUROD holders. 3. **Irreversibility of DLT transactions.** EUROD transfers from one blockchain address to another are irreversible and ODDO BHF does not have the ability to cancel or return an EUROD transfer after the transaction has been executed. EUROD holders assume full responsibility of any loss that may result from sending EUROD to the wrong address or on a blockchain address that is not supported by ODDO BHF for issuing or redeeming EUROD.
F.4	**Mitigation measures**	Regarding the different risks identified in sections F.1, F.2 and F.3, ODDO BHF applies several measures to identify the significance and the likelihood of risk, and implements appropriate measures to protect its customers: 1. **REGARDING ISSUER-RELATED RISKS** 1.1. **Bankruptcy Risks**. ODDO BHF's bankruptcy will have no impact on the rights of EUROD holders. If ODDO BHF goes bankrupt, its customers' funds are protected by law and cannot be used to compensate the company's other creditors. Any EUROD will be refunded to its holders at the end of ODDO BHF's bankruptcy proceedings, without the holder necessarily having to file a claim for compensation. 1.2. **Third-party Risks**. The bankruptcy of a crypto-asset service provider that has entered into a partnership with ODDO BHF would have no impact on the EUROD collateralisation, and EUROD token holders will still be able to request the direct redemption of EUROD from ODDO BHF. In addition, third parties with whom ODDO BHF engages in business relations are subject to due diligence procedures to ensure their financial viability and to limit any other risk of non-compliance.

		1.3. AML/CFT Risks. Each EUROD redemption request to ODDO BHF requires the holder to comply with the laws and regulations applicable to anti-money laundering and counter-terrorist financing in the European Union. Moreover, if ODDO BHF determines that EUROD transactions linked to public addresses are likely to be associated with criminal offences, ODDO BHF may decide to freeze the associated EUROD (temporarily pending clarification or permanently). Also, if ODDO BHF receives an injunction from a French judge or national authority to freeze EUROD, ODDO BHF will comply with such a request. **1.4. Personal Data Risks**. Pursuant to the General Data Protection Regulation, ODDO BHF is required to take all necessary precautions, with regard to the nature of the data and the risks presented by the processing, to preserve the security of EUROD holders' personal data and, in particular, to prevent it from being distorted, damaged or accessed by unauthorized third parties. **2. <u>TOKEN-RELATED RISKS</u>** **2.1. Financial stability Risks.** Financial stability risks associated with EUROD are currently extremely limited due to (i) the limited size of the EUROD compared to traditional financial markets and (ii) considering that the current use cases of the EUROD remain are not intended to be interconnected with traditional financial markets insofar as EUROD will mainly be used to facilitate exchanges of other crypto-assets on crypto-asset markets exclusively or be used as a store of value and hedge crypto-asset users against volatility risks associated with this asset class. **2.2. "Depeg" risk.** Even in case of market volatility, ODDO BHF plans to execute the redemption requests of eligible holders in a prompt manner. Therefore, "depegs" of EUROD, if they happen, should not last long, since market participants could engage in arbitrage activities until the price comes back to €1. If the "depeg" is caused by an inadequacy of the safeguarded funds, ODDO BHF will apply its redemption and recovery policies that will be designed to ensure the best possible redemption of EUROD and to respond to scenarios of extreme demand for redemption in unfavorable market conditions. **2.3. Liquidity risks.** ODDO BHF has redemption and recovery policies designed to ensure the best possible redemption of EUROD and to respond to scenarios of extreme demand for redemption in unfavorable market conditions. To this end, ODDO BHF will apply the measures set out in these two policies.

		2.4. Scam risks. ODDO BHF cannot prevent attempts at fraud and scams in connection with EUROD. ODDO BHF is not liable for this type of loss. From time to time, ODDO BHF will inform its clients of such risks through various channels. **2.5. Taxation Risks**. ODDO BHF cannot be held responsible for any tax consequence related to the purchase or use of EUROD. **3. <u>TECHNOLOGY-RELATED RISKS</u>** **3.1. Risks related to the Distributed ledger technology.** While these risks exist, like for all other DLT networks, the Polygon network is recognized for its high level of security since its creation in 2020. In this respect, ODDO BHF ensures that the DLT on which EUROD is issued meets high security standards. • <u>In term of organization</u>: The Polygon network is developed by Polygon Labs, a software company with members whose identities is <u>publicly disclosed</u>. Also, Polygon's smart contracts are managed by a multisig wallet to ensure that no member of the management body can fraudulently misuse the network's crypto-assets. • <u>In term of audits</u>: Before deploying or updating a smart contract, Polygon Labs carries out a security audit on it to ensure that no potential or proven vulnerabilities exist. If a vulnerability is detected, Polygon Labs implements the necessary measures to guarantee the security of the network. • <u>In terms of cybersecurity improvements</u>: As part of the Polygon upgrade (known as "Polygon 2.0"), the Polygon PoS chain will move to a zkEVM <u>validium system</u>. Validiums are scaling solutions designed to improve the number of network transactions from the Ethereum network (layer 1) - More information on validiums can be found <u>here</u>. Ethereum, acting as a settlement layer, also guarantees the validity of transactions on Polygon. This development enables Polygon PoS to improve network security and performance. In parallel, Polygon recently introduced the <u>Polygon Protocol Council</u>, an internal organization responsible for carrying out regular and emergency updates to ensure the network's security. • <u>In term of ability to support high frequency</u>: in the fourth quarter of 2023, the Polygon network recorded an average of 372,000 daily active users representing 4.5 million transactions[1]. This has

[1] Source: Messari

		resulted in several major players building their product on this network, such as HSBC, Amazon and 21Shares. • In term of ability to react to identified security risks: Polygon Labs has teams available in real time to identify any vulnerabilities on the Polygon network. In the event of a failure, Polygon Labs takes all necessary action to resolve the problem and keeps the community informed through detailed publications (an example is available in this link). The above elements are not exhaustive and other complementary factors allow ODDO BHF to consider that the Polygon network offers a significant level of security to ensure the issuance of EUROD. **3.2. Smart contract risks**. To reinforce the resilience of the smart contracts for the EUROD issuance, ODDO BHF is making the contract addresses linked to the EUROD issuance open source so that anyone can consult them and alert ODDO BHF in the event of a default. The code source of the smart contracts is publicly available in real time at the following URL: https://polygonscan.com/token/0xd37af043481da92eb7e218254952830c066cbcf5#code In addition, each smart contract relating to the EUROD issuance has been audited. In the event of a modification to the source code (even a minor one), the smart contract is audited again to ensure that no potential security exploit can be used to fraudulently use the EUROD Mint or Burn system or to circumvent its initial use by other means. More specific information on the audits carried out on the EUROD is detailed in sections E.9 and E.10. **3.3. Irreversibility of DLT transactions.** ODDO BHF cannot prevent DLT transactions from being irreversible. ODDO BHF is not liable for this type of loss. From time to time, ODDO BHF will inform its clients of such risks through various channels of communication.

Part G. : Information on the sustainability indicators in relation to adverse impact on the climate and other environment-related adverse impacts

II- Principal Adverse Impacts (PAI)

We identified the following material PAIs related to the issuance and management of our stablecoin on Polygon.

Category	Subcategory	Principal adverse impacts	Regarding stablecoin's blockchain (Polygon)
Energy Consumption	Energy Usage	Some blockchain networks require substantial computational power and energy. This leads to high electricity consumption, which can have a significant environmental footprint.	However, our stablecoin leverages the Polygon network, a scaling solution for Ethereum, known for its energy-efficient Proof-of-Stake (PoS) consensus mechanism. Compared to the traditional Proof-of-Work (PoW) systems, PoS significantly reduces energy consumption and carbon footprint.
	Carbon Emissions	The energy used by blockchain networks is often derived from fossil fuels, especially in regions where renewable energy sources are not prevalent. This can result in substantial carbon emissions, contributing to climate change.	Given that the energy consumption of Polygon PoS is extremely low compared to PoW blockchains, its corresponding carbon footprint should be low as well. Polygon communicates on its initiatives for carbon compensation, however, we decided to exclude the compensation from our study.
E-Waste	Hardware Degradation	The hardware used for mining and maintaining blockchain networks, such as specialized ASIC (Application-Specific Integrated Circuit) machines and GPUs (Graphics Processing Units), has a limited lifespan. This leads to the generation of electronic waste (e-waste) when outdated equipment is discarded.	PoS consensus mechanism does not require specific hardware and equipment running the network software should be rather generic.
	Resource Extraction	Production of electronic equipment requires the extraction of numerous materials. This extraction process can have detrimental environmental impacts, including habitat destruction, soil and water pollution, and increased carbon emissions.	The need for specific mining equipment in PoW systems leads to more resource extraction for their production. This issue is less of a concern with PoS systems like Polygon, where standard computing devices can be used.
Water Usage	Cooling Requirements	Data centers and mining operations generate substantial heat, necessitating cooling systems that often consume large amounts of water. This can strain local water resources, particularly in areas already facing water scarcity.	Since PoS systems generate less heat due to their reduced compute requirements, they require less cooling, which further decreases energy consumption.
	Energy production	Power plants, depending on their type, can have an important water consumption. This can strain local water resources, particularly in areas already facing water scarcity.	By minimizing its energy demand, Polygon indirectly contributes to the preservation of water resources and the reduction of the overall environmental impact.

Category	Subcategory	Principal adverse impacts	Regarding stablecoin's blockchain (Polygon)
Land usage & Environmental Degradation	Energy production	Power plants and large-scale mining operations can have direct environmental impacts on local ecosystems. For example, mining facilities often require significant land use, which can lead to deforestation and the destruction of natural habitats.	Polygon's PoS consensus mechanism requires less physical space than PoW systems, as there is no need for massive mining infrastructure. This reduces the impact on land use.

II- General information and key indicators

From the presented PAIs, we decided to provide a limited set of environmental indicators.

First, we will study the global blockchain infrastructure impact and then extrapolate the numbers to the stablecoin.

A- Sustainability of the Polygon Blockchain

1) Energy

The energy consumption of the Polygon blockchain is relatively low compared to many other blockchain networks. According to a report by the Crypto Carbon Ratings Institute (CCRI), the energy consumption of the Polygon network is significantly reduced due to its use of a Proof of Stake (PoS) consensus mechanism. This approach greatly lowers its carbon footprint and energy requirements, especially when compared to Proof of Work (PoW) networks like the former Ethereum network, now also in PoS.

Polygon's design as a scaling solution, built on top of Ethereum, optimizes transaction processing and reduces the overall energy consumption further. Specific metrics from the CCRI indicate that the annual energy consumption of Polygon is minimal, contributing positively to its environmental sustainability efforts (CCRI Climate Impact & ethereum.org).

Polygon uses Ethereum to secure its transactions. Therefore, assessing Polygon environmental footprint requires to assess for a part or share of the Ethereum network.

Pease find below the details of environmental metrics on both Polygon and Ethereum network:

The Polygon network's annual energy consumption is approximately 123,815 KWh and the Ethereum network's annual energy consumption for Polygon management is approximately 9,721 kWh, using respectively 67.91% and 66.24% of non-renewable energy. The energy intensity (amount of energy used by validated transaction) is very low: 0.006 Wh/Tx on the Polygon network and 0.009 Wh/Tx on the Ethereum network.

By converting energy consumption to Greenhouse gases, we observe an annual carbon footprint (Scope 1 to Scope 3) of 166.50 tCO_2e for Polygon network (including 1.15 tCO_2e for Scope 1, 45.93 tCO_2e for Scope 2, 119.42 tCO_2e for Scope 3) and 12.14 tCO_2e for the share of Ethereum used for Polygon management (including 0.08 tCO_2e for Scope 1, 3.35 tCO_2e for Scope 2 and 8.71 tCO_2e for Scope 3). The Greenhouse gases intensity (average GHG by validated transaction) is also very low: 0.002 gCO_2e/Tx for Polygon network and 0.003 gCO_2e/Tx for the share on Ethereum network.

We also provide an alternative measurement for Polygon carbon footprint available in the grids below.

Adverse Sustainability Indicator	Perimeter	Value	Metric Description	Methodology/Explanation/Sources
Energy consumption	Polygon PoS	1) 123.815 MWh 2) 297.062 MWh	Total amount of energy used, expressed in megawatt-hours (MWh) per calendar year, for the validation of transactions and the maintenance of the integrity of the decentralized ledger by Polygon Proof of Stake (PoS) protocol. Underlying metrics: Best guess node consumption: 546.07 kWh/year (as per CCRI estimate) Validator nodes: 200 (by design) Active nodes: 544 (source PolygonScan node tracker: https://polygonscan.com/nodetracker https://green.polygon.technology	Based on CCRI Energy Efficiency and Carbon Footprint of the Polygon Blockchain. This methodology accounts for the respective energy consumption of Polygon PoS network and the one of the parts of Ethereum energy consumption related to the interoperability between Polygon and Ethereum chains. Ethereum and Polygon are both PoS network. The global energy consumption is derived from: an estimation of the energy consumption of a node defined as a hardware and software configuration requiring a specific electricity power, the number of active nodes of the blockchain. It must be noted that CCRI's methodology limits the number of nodes to the number of validators (a validator on Polygon consists in a full node and sentry node) Validators are by design limited to 100, which gives us 200 nodes used for these validators. First proposed value (1) is taken directly from Polygon Sustainability dashboard (as of June 21st, 2024) For comparison purpose, we propose an alternative estimate (2) based on the total number of actives nodes as provided by Polygonscan. For the Ethereum PoS share allocated to Polygon activities, we can analyze the activity of all Polygon smart contracts deployed on Ethereum as described in CCRI Polygon Update Report 2022. The number we provide here comes from this report. We also add the underlying metrics that could be used for the calculation with an attribution related to these smart contracts' gas consumption.
	Eth PoS share	9,721kWh	Total amount of energy used, expressed in kilowatt-hours (KWh) per calendar year, for the validation of transactions and the maintenance of the integrity of the attributed share of Polygon transactions on Ethereum blockchain. Underlying metrics: Best guess Eth node consumption: 547.01 kWh/year (as per CCRI estimate) Eth Beacon nodes:10800 (source MigaLabs Ethereum Monitor: https://monitoreth.io/nodes (as of June 21st, 2024) Ethereum annualized gas consumption (2023) (3.79E+13 wei - https://etherscan.io) Polygon Smart Contract on Ethereum annualized gas consumption	
Non-renewable energy consumption	Polygon PoS	1) 67.91% 2) 76.54%	Share of energy used generated from nonrenewable sources, expressed as a percentage of the total amount of energy used per calendar year, for the validation of transactions and the	Using validator node geographical distribution at the country level and national energy production mix data, we can estimate the share of non-renewable energy consumption.

Adverse Sustainability Indicator	Perimeter	Value	Metric Description	Methodology/Explanation/Sources
			maintenance of the integrity of the distributed ledger of transactions.	We will use two different sources for the geographic distribution: Polygon communication on decentralization: https://polygon.technology Polygonscan node tracker: https://polygonscan.com (as of June 21st, 2024) According to Polygonscan, 95% of all nodes are located in the USA. We therefore consider USA energy mix to produce the metric. Share of renewable energy is sourced from: https://ourworldindata.org (as of 2022) Alternative source for electricity production energy mix and renewable share can be considered: (EIA US energy mix) 2022 EU energy report from European Conseil on renewable energy production.
	Eth PoS	66.24%		For Ethereum, we use the following sources to identify the node distribution and the report on renewable energy. https://monitoreth.io/nodes (as of June 21st, 2024) https://ourworldindata.org/renewable-energy (as of 2022)
Energy intensity	Polygon PoS	0.006 Wh/Tx 0.268 Wh/Tx	Average amount of energy used, in kWh, per validated transaction. Underlying metrics: Global Polygon PoS yearly energy consumption (297.062 MWh) Yearly Polygon (2023) transactions volume (1.11 billion transactions)	We provide two different values: From CCRI and available on Polygon sustainability report (as of June 21st, 2024), including the integration of a share of the energy consumption between transactions and position holding. A straightforward attribution of the energy consumption on the transactions based on the global volume of yearly transactions. We deliberately chose the most important value to keep a conservative approach.
	Eth PoS share	0.009 Wh/Tx	Underlying metrics: Share of Ethereum PoS yearly energy consumption (9,721kWh) Yearly (2023) Polygon transactions volume (1.11 billion transactions)	We calculate here the energy consumption per Polygon based on the share of Ethereum activity for the management of Polygon.
	Polygon PoS	0.4 ha		

Adverse Sustainability Indicator	Perimeter	Value	Metric Description	Methodology/Explanation/Sources
Land use			Land use for the electricity production related to the upkeep of the Polygon blockchain network in ha. Land use for the electricity production related to the upkeep of the Polygon blockchain network in ha.	We use the geographical distribution of validator nodes and related energy consumption, the national energy mix and available data for land and water used for unit of energy production. Due to missing data, we use a global USA mix for Polygon and a World mix for Ethereum. Sources : https://www.statista.com https://ember-climate.org EIA.gov Chathamhouse.org Waterfootprint.org
	Eth PoS share	20.1 ha	Land use for the electricity production related to Polygon share for the upkeep of the Ethereum blockchain network in ha.	
Water footprint	Polygon PoS	1,414 m3	Water consumption in m^3 for the electricity production related to the upkeep of the Polygon blockchain network.	
	Eth PoS share	60,715 m3	Water consumption in m^3 for the electricity production related to Polygon share for the upkeep of the Ethereum blockchain network in ha.	

Regarding the process end of life, Polygon network's annual generation of waste electrical and electronic equipment (WEEE) is estimated at 806 kg (with a 19% recycled WEEE ratio) and Ethereum network's annual generation of WEEE is estimated at 51 150kg (with a 31% recycled WEEE ratio). Finally, the annual generation of hazardous waste represents only 0.00015 t for Polygon network and 0.00956 t for Ethereum network.

For more detailed metrics and insights, you can refer to the CCRI report on Polygon.

2) GHG Emission

Adverse Sustainability Indicator	Perimeter	Value	Metric Description	Methodology/Explanation
Scope 1 - Controlled	Polygon PoS	1.15 tCO_2e 2.75 tCO_2e	Scope 1 GHG emissions, expressed in tonnes (t) carbon dioxide equivalent (CO_2e) per calendar year for the validation of transactions and the maintenance of the integrity of the distributed ledger of transactions. Underlying metrics: Polygon PoS scope 2 45.93 tCO_2e 110.21 tCO_2e Scope1/Scope2 ratio from MS Azure	Given the decentralized nature of the blockchain network and its global reliance on cloud infrastructure, we consider that the direct GHG emission of both blockchain network is neglectable. Previous works on cloud providers may allow for a very limited share of the global energy consumptions coming from fuel backup generators. From Microsoft Azure carbon footprint data, we can apply a proxy of Scope 1 at 2.5% of Scope 2.
	Eth PoS share	0.08 tCO_2e	Scope 1 GHG emissions, expressed in tonnes (t) carbon dioxide equivalent (CO2e) per calendar year for the validation of transactions and the maintenance of the integrity of the distributed ledger of transactions. Underlying metrics: Eth PoS share scope 2 Scope1/Scope2 ratio from MS Azure	
Scope 2 - Purchased	Polygon PoS	45.93 tCO_2e 110.21 tCO2e	Scope 2 GHG emissions, expressed in tCO_2e per calendar year for the validation of transactions and the maintenance of the integrity of the distributed ledger and transactions. Underlying metrics: Polygon PoS energy consumption (1 and 2) 123.815 MWh 297.062 MWh Weighted electricity carbon intensity per node location (371gCO_2e/kWh)	Scope 2 emissions are derived from the previous energy consumption data collected previously, node geographical distribution at country level and national carbon intensity of energy production. Electricity carbon intensity per country: https://ourworldindata.org
	Eth PoS share	3.35 tCO_2e	Scope 2 GHG emissions, expressed in tCO_2e per calendar year for the validation of transactions and the maintenance of the integrity of the distributed ledger and transactions. Underlying metrics: Ethereum PoS Polygon share energy consumption: 9721 kWh Weighted electricity carbon intensity per node location (345gCO_2e/kWh)	

Adverse Sustainability Indicator	Perimeter	Value	Metric Description	Methodology/Explanation
Scope 3 – value chain	Polygon PoS	119.42 tCO_2e 286.55.72 tCO_2e	Underlying metrics: Polygon PoS Scope 2 Scope3/Scope2 ratio from MS Azure	Given the decentralized nature of blockchain network, it's not possible to clearly identify the hardware equipment used to run the blockchain software. We made some assumption on the estimated equipment though, and these assumptions could be used to estimate a scope 3 carbon footprint. Based on previous studies by DELL we can apply a proxy on generic server hardware with a ratio between Scope 2 and Scope 3. Source: https://corporate.delltechnologies.com Therefore, we can apply a 0.9 ratio from Scope 2 emissions to get a Scope 3 estimate. Another estimate is based on Microsoft Azure data. As for Scope 1, we can extrapolate a Scope 3 ratio from Scope 2. We remark that this ratio, 2.6, is higher than the one coming from Dell because it includes all services coming from a cloud offering. We will use this ratio which seems to be more relevant of the could services as a whole.
	Eth PoS share	8.71 tCO_2e	Underlying metrics: Eth PoS share Scope 2 Scope3/Scope2 ratio from MS Azure	
GHG intensity	Polygon PoS	0.002 gCO_2e/Tx 0.099 gCO_2e/Tx	Average GHG emissions (Scope 2) per validated transaction, expressed in gCO2e per transaction (Tx). Underlying metrics: Energy intensity per transaction 0.006 Wh/Tx 0.268 Wh/Tx Weighted electricity carbon intensity per node location (371gCO2e/kWh)	From the numbers found for energy intensity per transaction, we derived the GHG intensity using the weighted carbon intensity of electricity on node regional distribution.
	Eth PoS share	0.003 gCO_2e/Tx	Average GHG emissions (Scope 2) per validated transaction, expressed in gCO2e per transaction (Tx). Underlying metrics:	

Adverse Sustainability Indicator	Perimeter	Value	Metric Description	Methodology/Explanation
			Energy intensity per transaction: 0.009 Wh/Tx Weighted electricity carbon intensity per node location (345gCO2e/kWh)	

3) Waste productions

Generation of waste electrical and electronic equipment (WEEE)[3]	Polygon PoS	805 kg	Total amount of WEEE generated for the validation of transactions and the maintenance of the integrity of the distributed ledger of transactions, expressed in tonnes per calendar year. Underlying metrics: Validator nodes count Validator node best guess hardware proposal	Based on the hardware estimates, we calculate the total weight of the devices. We depreciate the hardware based on the length of the respective manufacturer guarantee and calculate an average annual waste over all hardware devices
	Eth PoS share	191 kg	Underlying metrics: Total yearly generation of WEEE generate for Ethereum PoS: 51.150t Share Polygon usage on Ethereum: 0.37%	From the estimated energy consumption of Ethereum and allocated energy consumption related to Polygon activity, we define a ratio on the total nodes hardware. We use this ratio to compute the relative share of hardware weight and waste. As per CCRI, Ethereum PoS consumption is 2600 MWh. Share for Polygon is 9.721 MWh. Our ratio is 0.37%
Non-recycled WEEE ratio[4]	Polygon PoS	81%	Share of the total amount of WEEE generated for the validation of transactions and the maintenance of the integrity of the distributed ledger of transactions, not recycled per calendar year, expressed as a percentage.	We collect electronic waste recycling rates of countries. If data is unavailable, we use recycling rates from the respective regions. Considering node locations and node counts, we can derive the total share of non-recycled electronic waste of the network. (Comparison: US, 85.3 %. Germany, 47.9 %.)
	Eth PoS share	68.10%		

Generation of hazardous waste[5]	Polygon PoS	0.15 kg	Total amount of hazardous waste generated for the validation of transactions and the maintenance of the integrity of the distributed ledger of transactions, expressed in kg per calendar year	Based on our electronic waste calculation, we further analyzed hardware specifications of a single device and its hazardous waste components. We used the share of hazardous waste as a proxy for all other devices for which such information was not available and ignored components such as cases.
	Eth PoS share	0.035kg	Underlying metrics: Total yearly generation of WEEE generate for Ethereum PoS: 9.56kg Share Polygon usage on Ethereum: 0.37%	See Generation of WEEE section.

B- Sustainability of the stablecoin

1) Transaction scenarios

The environmental impact of the stablecoin is directly deduced from the following data:

- The global environmental footprint of the blockchain infrastructure
- The total average yearly volume of transactions
- The estimated yearly volume of transactions of the stablecoin

For this reason, we need to propose different scenarios of transactions volumes given the stablecoin issuing volume.

We base our estimate on previous stablecoin issuances on Polygon and from Visa stablecoins activity tracker: https://visaonchainanalytics.com

This provides the total number of transactions from January 2023 to June 2024, i.e. 18 months.

Total Stablecoin Cumulative Metrics (since January 2023)

View

Source: Allium

Stablecoin	Blockchain	Total USD Amount	Total Transactions
USDC	solana	$7.832T	1.407B
USDT	tron	$5.964T	1.027B
USDC	ethereum	$3.945T	34.983M
USDT	ethereum	$2.587T	76.355M
USDT	bsc	$742.873B	880.433M
USDC	arbitrum	$322.821B	150.21M
USDT	solana	$297.443B	193.417M
USDC	optimism	$174.498B	83.788M
USDT	arbitrum	$167.758B	63.87M
USDC	polygon	$140.022B	160.728M
USDC	avalanche	$121.767B	31.283M
USDC	bsc	$111.131B	40.487M
USDT	polygon	$104.352B	140.292M
USDC	base	$94.949B	36.965M
USDC	tron	$89.56B	1.589M
USDT	avalanche	$69.598B	17.817M
USDT	optimism	$31.835B	14.723M
USDP	ethereum	$21.272B	90.364K
PYUSD	ethereum	$3.04B	135.366K
PYUSD	solana	$0.00	1.016K

We found that the transaction count is not correlated to the stablecoin issued amount on different blockchain networks. However, we observe, even if it's on a limited number of observations, that the ratio between the average issued volume of stablecoin ($105B for USDC and $92B for USDT on 2023-2024) and the total number of transactions is similar on Polygon between USDC (160M) and USDT (140M) (approx. 1.5M transactions per billion on 18 months, 1M transactions on one year).

Therefore, we apply this ratio to estimate a yearly number of transactions on our stablecoin with an issuance of EUR 15M (€0.015B) which leads us to 15 000 transactions (0.015M transactions). With a yearly total of **1.11 billion** transactions in 2023 on Polygon, this accounts for only **0.00135%** of the total environmental impact of Polygon.

From this, we can compute the yearly estimated energy consumption of our stablecoin with two different methods:

- Apply the share of our stablecoin on the total number of transactions of the whole Polygon network. Given our two estimates on the energy consumption of Polygon:
  1) 123.815 MWh
  2) 297.062 MWh

plus, Ethereum share, 9.721MWh, and multiply by 0.0000135, we have respectively:

  - 1.804 kWh
  - 4.146 kWh

- Apply the estimated transaction count to the energy intensity per transaction. Given our two estimates.
  1) 0.006 Wh/Tx
  2) 0.268 Wh/Tx

plus, Ethereum share, 0.009 Wh/Tx, and multiply by 15k transactions, we have respectively:

  - 0.225 kWh
  - 4.155 kWh

DATA USE	Projected count of yearly stablecoin transactions	Share of projected stablecoin transactions on total transactions count of Polygon	Polygon PoS energy consumption 1	Polygon PoS energy consumption 2	Ethereum PoS energy consumption (specific Polygon share)	Polygon energy intensity 1	Polygon energy intensity 2	Ethereum energy intensity (specific Polygon share)
VALUE	15,000	0.0000135	123.815MWh	9.721MWh	9.721MWh	0.006Wh/Tx	0.268Wh/Tx	0.009Wh/Tx