



底格里斯协议

基于TTC平台的安全高效的去中心化金融解决方案

V0.9





Disclaimer

IMPORTANT: YOU MUST READ THE FOLLOWING DISCLAIMER IN FULL BEFORE CONTINUING

The sale of the CLAY tokens ("**CLAY TGE**"), the tokens native to the Tigris Protocol, a protocol to be developed and maintained by TTC Foundation and/or its affiliate(s) as detailed in this whitepaper ("**Whitepaper**") is only intended for, made to or directed at person(s) (a) who is not a citizen, domiciled in, or resident of the United States of America or the People's Republic of China (which for the purpose of these Terms, shall exclude the Hong Kong Special Administrative Region of the People's Republic of China, the Macau Special Administrative Region of the People's Republic of China, and the Republic of China) ("PRC"); and (b) outside the United States of America or PRC, and may be acted upon only by such persons. Moreover, this Whitepaper is not, is not intended to be and should not be construed to be, a prospectus or offer document of any sort and is not intended to and should not be construed to constitute an offer of shares or securities of any form, units in a business trust, units in a collective investment scheme or any other form of investment, or a solicitation for any form of investment in any jurisdiction. No regulatory authority has examined or approved of any of the information set out in this Whitepaper. This Whitepaper has not been registered with any regulatory authority in any jurisdiction.



The focus of this Whitepaper is on the Tigris Protocol (as defined herein). You may have received, been in possession of or perused this Whitepaper, which contains additional important (related) information about the Tigris Protocol (or, the "**Project**"), including the CLAY tokens, and CFIAT (as detailed herein) and their functions. This Whitepaper and such other documents in relation to the Tigris Protocol as may be published or drafted by the project team, each as may be amended, modified, or supplemented from time to time (collectively with the Whitepaper, the "**Project Documents**") are intended to be read in conjunction with one another for the purpose of any proposed purchase of CLAY tokens.

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For the avoidance of doubt, the Project Group is not, and will not be, offering the TTC Coins and/or CFIAT (as defined herein) for sale to any persons or in the United States of America or the People's Republic of China (which for the purpose of these Terms, shall exclude the Hong Kong Special Administrative Region of the People's Republic of China, the Macau Special Administrative Region of the People's Republic of China, and the Republic of China) ("PRC").

By accessing and/or accepting possession of any information in this Whitepaper or such part thereof (as the case may be), you represent and warrant to the token vendor of the CLAY TGE ("**CLAY Token Vendor**") that:



you are not a citizen or resident of a country the laws of which prohibit or conflict with the Token Sale or your participation in the Token Sale (as referred hereto in the White Paper) ("**Excluded Person**");

1. you have read the entirety of this Whitepaper and understand the risks entailed in your purchase of CLAY tokens;

2. you agree to be bound by the limitations and restrictions described herein; and

3. you acknowledge that this Whitepaper has been prepared for delivery to you so as to assist you in making a decision as to whether to purchase CLAY tokens.



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01 介绍

去中心化金融（“DeFi”）服务为全球用户提供一种全新的方式来存储、管理和使用个人的资产。DeFi基于区块链技术，具有无需授权、无需信任、无需审查、公平透明的特点。最近，DeFi项目大量诞生，在各个金融领域得到了快速应用。

作为DeFi先驱之一的MakerDAO为用户提供去中心化的质押债务服务，允许ETH所有者在不出售其ETH资产的情况下产生并消费稳定币。根据2019年3月的报告，超过210万ETH，即整个ETH供应量的2%，被锁定在Maker智能合约中，发行了价值8800万美元的稳定币¹。

但MakerDAO也不是一个完美的系统。MakerDAO的治理是通过MKR持有人的委托投票来实现的，调整主要是基于公众的意见。最近其稳定费激增，在三个月内从0.5%增加到19.5%（39倍）²。这说明非专业人员可以轻松操纵整个系统，由于人为错误和故意违规，这种治理机制体现出比较明显的低效率和局限性。

底格里斯协议是基于TTC平台的安全高效的DeFi服务协议。底格里斯协议的名字来自底格里斯河，古巴比伦文明诞生于此。巴比伦人用粘土片来保存交易记录，这是人类历史上最早的分帐本之一。

¹ <https://medium.com/makerdao/making-maker-march-2019-d03bb338d6ba>

² <https://vote.makerdao.com>



底格里斯议定书包括质押借贷服务（“CDS”），TTC质押服务（“TSS”），底格里斯奖励计划和底格里斯借记卡（实物支付卡），由一组稳定币“CFIAT”实现。

本白皮书将详细解释了底格里斯协议的核心组成部分、功能和治理。



02

综述

底格里斯协议通过其独立但相互关联的服务，为用户提供借款服务和奖励计划，本节将介绍维持底格里斯协议服务运作的加密货币和核心组件。

2.1 代币

CFIAT

CFIAT是在TTC平台（“TTC平台”）上发布的一系列去中心化的TST-20稳定币，它通过利用各种类型的资产作为质押来最小化价格波动。通过锁定资产作为质押品，任何人都可以生成与其选择的法定货币挂钩的稳定币。例如，CUSD与美元挂钩，CCNY与人民币挂钩，CKRW与韩元挂钩等。

CFIAT具有以下特征：

稳定

由于CFIAT作为借贷债务发行，反映了用户质押资产的价值，保持CFIAT价值的稳定性非常重要。每个CFIAT都被另一个有价值的资产所支持，多资产质押机制也增加了CFIAT的稳定性。



有弹性

底格里斯服务系统由去中心化的智能合约治理，基于严谨的数学逻辑，而非用户的投票决定。该系统旨在通过消除由人为误判和故意违规造成的错误，以提供最大的稳定性。

如果所有安全机制被破坏，则启动终极清算（在[5.3 终极清算](#)中详细说明）以维持CFIAT的稳定性。

可靠

CFIAT作为稳定币具有独特的优势。用户可以利用其稳定性存储资产，商家可以接受CFIAT作为支付方式，而不必担心由于价格波动造成的损失。

随着底格里斯协议的扩展，未来将有更多的线上线下的使用场景。

CLAY

CLAY代币是TST-20协议下的代币，用于维持底格里斯协议的稳定。CLAY代币用于支付CDS服务费，CLAY代币也被用作底格里斯奖励计划的奖励手段，用户通过质押CLAY代币可以获得额外的奖励。

CLAY代币共2,500,000,000个，分配方式如下：

- 40%（1,000,000,000个CLAY代币）将通过CLAY代币生成活动（“CLAY TGE”）产生；
- 40%（1,000,000,000个CLAY代币）通过底格里斯协议智能合约分配给CLAY储备金；
- 10%（250,000,000个CLAY代币）分配给TTC基金会，这部分CLAY代币将永久质押，不允许撤回，获得的质押奖励将用于支付运营成本；



- 10% (250,000,000个CLAY代币) 将用于建设底格里斯生态系统 (“生态系统建设”) 。



2.2 核心组件

本节将介绍各种旨在维持底格里斯协议可持续运作的核心组件。

投票优化器 (“SAVE”)

投票优化器 (“SAVE”) 是一个基于AI的自动投票引擎，旨在通过投票到超级节点 (TTC平台的区块生产者) 来产生最大化的投票奖励。底格里斯协议使用SAVE管理用户TTC代币，并为用户产生稳定和持续的投票奖励。

SAVE根据超级节点的所有相关参数计算预期回报，例如出块率、出块率、交易信度和得票数，并代表用户进行投票。

底格里斯储备金

底格里斯储备金是指为维持CDS稳定性而保留的资产。在质押品价格大幅下跌的极端情况下，底格里斯储备金将处理用户未偿还的CFIAT债务，防止系统崩溃。

底格里斯储备金包括CLAY储备金和TTC储备金区，初期，底格里斯储备金包含以下内容：

- CLAY储备金：1,000,000,000个CLAY代币
- TTC储备金：50,000,000个TTC代币，来自TTC基金会的生态系统建设基金和CLAY代币产生活动



SAVE服务费，即SAVE投票奖励的20%，将分配给底格里斯储备金。随着底格里斯储备金的资产价值增加，质押借贷服务能够在不增加系统风险的情况下支持更多的债务。

每个月，底格里斯储备金的一小部分将被扣除作为每月维护费用分配给TTC基金会。有关详细信息，请参阅[5.6 月度维护成本](#)。



2.3 底格里斯借记卡

购买力是货币的关键价值之一，货币应该具有固有价值，可与其他同等价值的商品或服务进行交易。

TTC基金会计划发行底格里斯借记卡，一种实物支付卡，用作数字资产的信用卡。底格里斯借记卡将与在发币支付方面有经验的支付解决方案服务供应商合作，为存储在底格里斯卡借记卡中的资产提供支持。用户可以安全地存储各种类型的加密货币，处理付款和转账，以及管理他们的付款记录。

通过集成现有的借记卡网络基础设施，底格里斯借记卡旨在能够处理任何接受借记卡/信用卡作为支付方式的支付终端³的付款。此外，底格里斯借记卡还可以通过移动应用或二维码支付（“QR”）处理线上/线下支付请求。

使用底格里斯借记卡，任何人都可以方便自由地使用加密货币，而无需将加密货币从移动钱包中转出或将其转换为法定货币。

³ 也被称作POS终端。



03

底格里斯协议

底格里斯协议支持一系列去中心化、安全、自主和系统化的金融服务，通过可靠的智能合约实现透明系统化的管理。底格里斯协议包括一系列DeFi服务（称为“底格里斯服务”），如质押借贷服务（CDS），TTC质押服务（TSS）和一系列与法币挂钩的稳定币。

底格里斯服务致力于为TTC平台生态系统提供去中心化金融服务，维持TTC代币和TST-20代币的稳定性，使TTC平台生态系统中的所有成员受益。

3.1 质押借贷服务（“CDS”）

质押借贷服务（“CDS”）为TTC代币和/或TST-20代币的持有人提供不失去对其资产的所有权情况下的资产流动性。用户可以对其加密货币资产进行质押，并依托于质押品生成稳定的CFIAT。以下是CDS的工作流程。

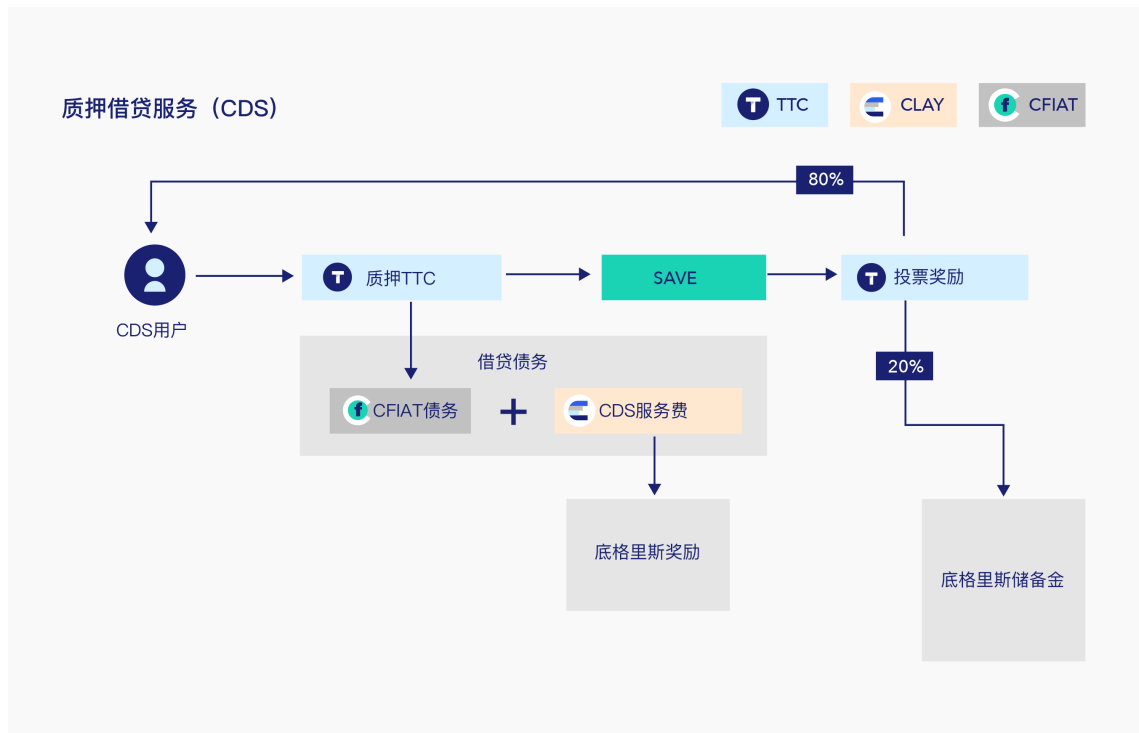


图 1. 质押借贷服务的价值流程

1: 存入TTC代币作为质押品

CDS用户首先向CDS智能合约发送TTC代币⁴，用于生成CFIAT。

CDS用户可以通过在SAVE上存入质押的TTC代币来获得投票奖励，从SAVE获得的投票奖励将存入用户质押的TTC代币池中，少量的SAVE服务费将被扣除并发送至CLAY奖励池。

2: 从质押的TTC代币中生成CFIAT

⁴ 最初，CDS只接受TTC代币作为质押品。有关更多详细信息，请参阅[5.7多资产质押](#)。



现在，CDS用户可以依托质押的TTC代币生成与其选择的法定货币挂钩的CFIAT，产生的CFIAT代币债务称为“CFIAT债务”。随着CFIAT债务的产生，部分质押的TTC代币被锁定，直至所有的债务被偿还。

初始质押率设定为50%，这意味着如果用户想要生成价值0.5的CFIAT，必须质押价值为1的TTC代币。超额质押机制可以保护质押品免受价格波动的影响。

3: 偿还CFIAT债务和服务费

当CDS用户想要解锁并取回其质押品时，需要偿还CFIAT债务和随时间累积的服务费，服务费需通过CLAY代币支付。

CDS用户偿还CFIAT债务和服务费后，相应的CFIAT将通过智能合约立即被销毁，用于支付服务费的CLAY代币将分配给底格里斯奖励池。

服务费金额根据CDS用户产生的CFIAT债务金额以及CDS系统中CFIAT债务总额计算。有关服务费的更多详细信息，请参阅[05治理](#)。

4: 取回质押品

在偿还了CFIAT债务和服务费后，CDS用户可以自由地将全部或部分质押品取回到钱包中。



3.2 TTC质押服务 (“TSS”)

TTC质押服务 (“TSS”) 允许TTC持有者通过质押TTC代币以获得来自SAVE的稳定的投票奖励。TSS提高了TTC共识的投票效率，以及TTC平台的稳定性。以下是TSS的工作原理：

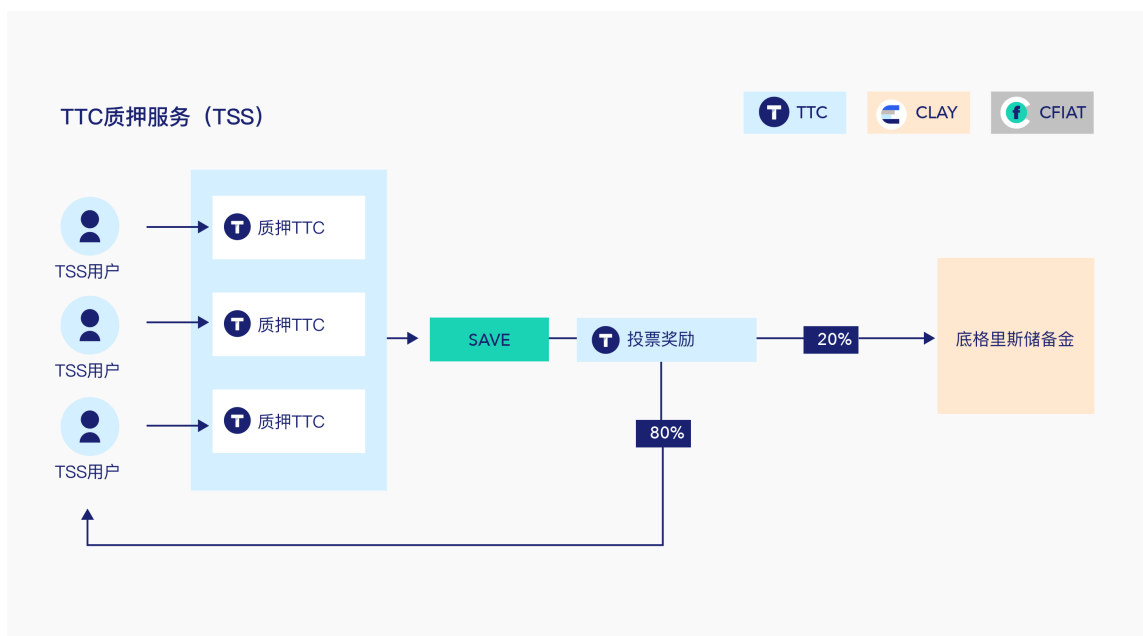


图2. TTC质押服务的价值链条

1: 质押TTC代币

TSS用户首先将他们的TTC代币质押到TSS智能合约中。

2: 从质押的TTC代币中获得奖励



SAVE的每日投票奖励将自动添加到用户的TTC质押池中。假设TSS用户在第**t+0**天开始质押TTC代币，其将从第**t+1**天开始接收投票奖励。

3: 取回质押的TTC代币

TSS用户可以随时取回质押的TTC代币。假设用户在第**t+0**天提交了取回请求，质押奖励将在第**t+1**天停止存入，用户将可以在第**t+2**天提取其质押奖励。



04

底格里斯奖励计划

为鼓励用户使用底格里斯服务，一系列奖励（统称为“底格里斯奖励”）将分发给使用CDS和TSS的用户，以及将来可能引入的其他底格里斯服务。目前有两个会员级别用于分发底格里斯奖励，即“非质押会员等级”和“质押会员等级”。

会员等级	标准	质押要求
第一级：非质押会员等级	用户（“第一级用户”）必须使用一个或多个底格里斯服务，这意味着生成至少1个CFIAT或1个质押的TTC代币。	无。
第二级：质押会员等级	用户（“第二级用户”）必须使用其中一个底格里斯服务并至少质押1个CLAY代币（“第二级CLAY代币质押”）。	我们通常需要一天（“取回周期”）从质押中释放用户质押的CLAY代币（“第二级CLAY代币质押”）。 第二级CLAY质押和取回周期构成了第二级用户的“第二级CLAY质押周期”。



接下来将说明Alice作为第一级用户和Bob作为第二级用户使用一个或多个底格里斯服务时可以接收的奖励。

第一级奖励：非质押用户级别

Alice作为第一级用户将获得第一级底格里斯奖励（“第一级底格里斯奖励”），奖励每24小时发放一次，由TTC基金会制定奖励规则。

她可以获得的第一级底格里斯奖励金额将取决于她使用底格里斯服务的程度。

Alice在相关期间使用CDS的第一级底格里斯奖励的公式如下：

1. 如果Alice在相关期间使用CDS，她将按以下方式获得第一级底格里斯奖励：

Alice在该期间用于生成**CFIAT**的质押
TTC数量

所有用户⁵在该期间用于生成**CFIAT**的
质押**TTC**数量

x

所有用户在该期间通过用于生成**CFIAT**
质押的**TTC**产生的总投票奖励

2. 如果Alice在相关期间使用TSS，她将按以下方式获得第一级底格里斯奖励：



Alice在该期间使用**TSS**所质押的**TTC**
数量

所有用户⁶在该期间使用**TSS**所质押的
TTC数量

x

所有用户在该期间通过**TSS**中质押
TTC产生的总投票奖励

因此，Alice使用底格里斯服务程度越高（用于产生CFIAT的质押TTC代币更多或使用TSS的质押TTC代币更多，视情况而定），她能获得的第一级底格里斯奖励数量就越多。

第二级奖励：质押用户级别

Bob是在相关期间使用底格里斯服务的第二级用户，他将有权获得第一级底格里斯奖励，同第一级用户一样。

除了第一级底格里斯奖励之外，如果（a）Bob对底格里斯服务的使用超过了规定的水平（“第二级最低活动要求”），以及（b）Bob同时质押TTC达到第二级CLAY质押要求（“第二级最低质押要求”），鲍勃可以在该相关期间获得进一步的底格里斯奖励（“第二级底格里斯奖励”）。

接下来，将参考使用底格里斯服务的TTC代币数量来衡量Bob使用底格里斯服务的程度。例如，如果Bob通过CDS质押500个TTC代币，并生成了100个CFIAT，同时在相关时段内质押500个TTC代币参与

⁵ 所有用户指的是第一级和第二级用户。



TSS，那么Bob的底格里斯服务使用将以1,000个TTC代币进行衡量。

Bob为满足第二级最低活动要求而需要达到的第二级最低活动取决于他选择质押的CLAY代币数以及他的第二级CLAY质押期的持续时间。

第二级最低活动的计算公式，即获得第二级底格里斯奖励条件如下：

$$\text{Bob质押的CLAY代币数量} \times \text{Bob质押CLAY代币的时长} \times \text{CDS因子}^7$$

及

$$\text{Bob质押的CLAY代币数量} \times \text{Bob质押CLAY代币的时长} \times \text{TSS因子}^8$$

注意到底格里斯协议将来可能接受其他TST-20代币作为质押品（如5.7多重质押中所述），上述公式届时将进行更新。

如果Bob满足第二级最低活动要求和第二级最低CLAY质押要求，他将获得第二级底格里斯奖励。在相关期间计算第二级底格里斯奖励的公式如下：

$$\frac{\text{Bob在该期间质押的CLAY代币数量}}{\text{所有用户在该期间质押的CLAY代币数量}} \times \text{分给该期间第二级底格里斯奖励的CLAY奖励池数量}$$

⁶ CDS因子为1或0，TTC基金会会根据具体情况进行调整。

⁷ TSS因子为1或0，TTC基金会会根据具体情况进行调整。

底格里斯奖励计划的价值链条如下图所示。

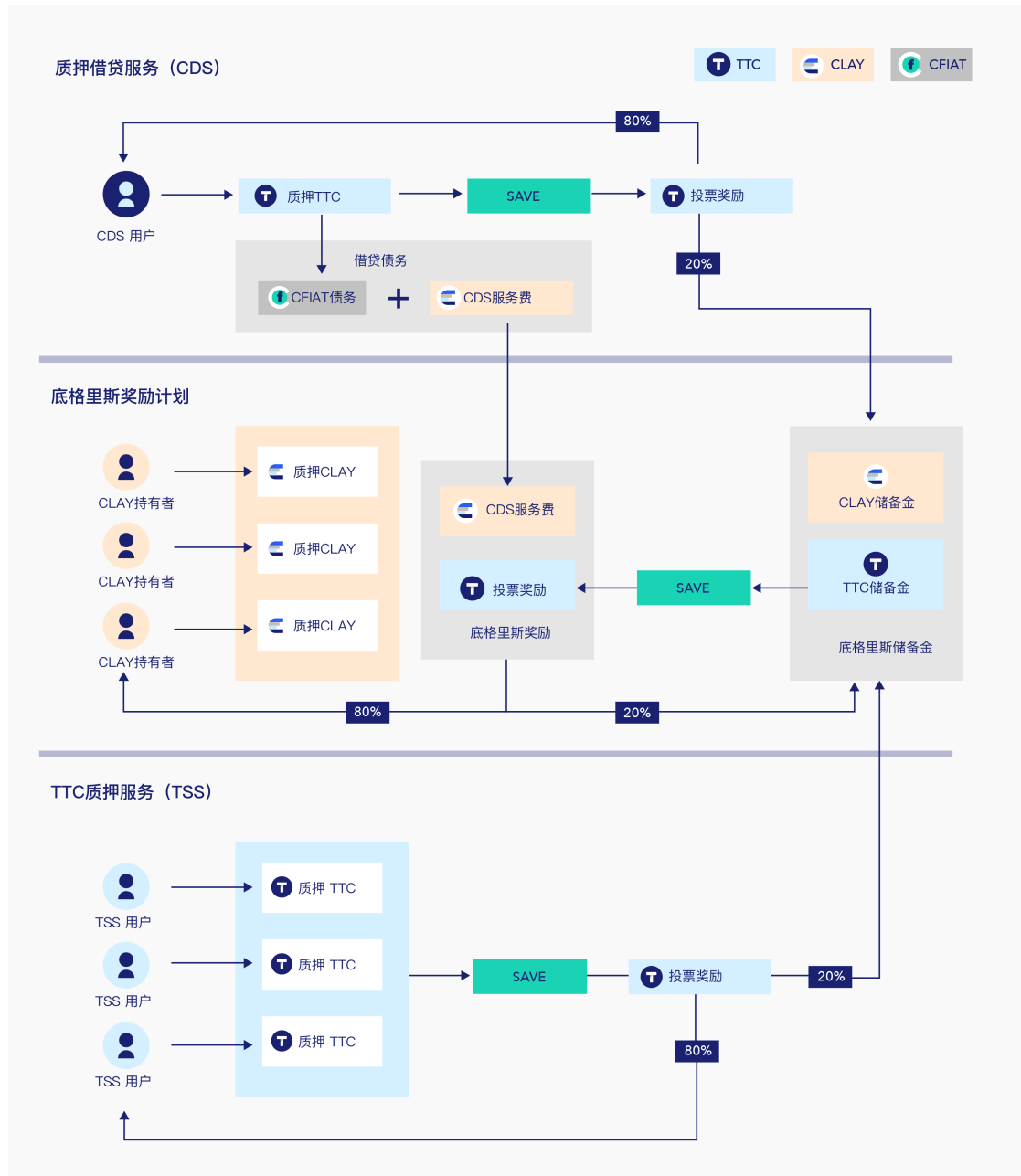


图3. 底格里斯奖励计划的价值链条



05

治理

与许多DeFi服务通过代币持有者投票作为治理机制不同，底格里斯服务的治理由一系列去中心化自动运行的智能合约实现，这种机制为底格里斯协议提供了两个关键优势。

- **高效**。依托于强逻辑的智能合约快速变化的加密货币环境提供了一致性的解决方案。
- **风险管控**。底格里斯服务可以避免人为错误和故意违规行为，这在投票治理体系中极为常见。

本章将介绍有关如何进行底格里斯协议治理的指导方针和规则。

5.1 CFIAT债务上限

为了CDS的稳定性，规定了可能产生最大的CFIAT债务（“CFIAT债务上限”）。一旦CFIAT债务在各种挂钩的法定货币中的总价值达到CFIAT债务上限，则不再允许继续生成CFIAT，直到一些CFIAT债务被偿还或CFIAT债务上限发生变化。在CDS中，CFIAT债务上限等同于底格里斯储备金的价值。

$$\text{CFIAT债务上限} = \text{底格里斯储备金价值}$$



初期，底格里斯储备金包含50,000,000个TTC代币和1,000,000,000个CLAY代币。随着底格里斯储备金的增加，CFIAT债务上限也将随之提升。

5.2 清算

当质押资产的价值低于CFIAT债务的价值时，所质押的资产便会进行清算。数学术语解释如下：

a. 质押率

质押率⁸反映了质押债务的健康状况。

$$\text{质押率} = (\text{CFIAT债务} + \text{服务费}) / \text{质押品价值}$$

CDS用户通过智能合约进行交易即可调整质押TTC代币的金额，质押更多的TTC代币将降低质押率，这使质押品更安全。另一方面，只要不超过质押率，用户就可以取回一定数量的TTC质押品，随之而来的质押率的提升，将增加TTC质押品的风险。

b. 清算率

⁸ 质押率的数值以用户选择的CFIAT挂钩的法定货币计量。



清算率用于描述质押品何时被清算。当质押率大于清算率时，质押品将被清算以偿还CFIAT债务。CDS的清算率设定为90%⁹，留出了10%缓冲空间。

对于CDS用户而言，应将其质押率维持在较低水平，可以通过存入更多资产作为质押品或偿还CFIAT债务（和服务费）来防止清算造成的损失。

举例：

Phillip质押了价值2,000欧元的TTC代币，并生成了价值1,000欧元的CEUR，假设应计服务费为8%（价值80欧元的CLAY），当TTC代币的价格下降到质押的TTC代币价值低于1200欧元时，即

$$\text{质押率} = (1,000 + 80) / 1,200 = 0.9 = \text{清算率}$$

现在质押率低于0.9，系统将开始在市场上出售质押的TTC代币以购买CEUR并偿还CFIAT债务。Phillip可以通过向质押品中添加更多TTC代币或在质押率达到0.9之前偿还部分CFIAT债务和服务费来避免这种情况发生。

5.3 终极清算

⁹ 如有更改，恕不另行通知。



当TTC价格急剧下降时，系统内CFIAT债务和TTC质押品价值之差大于底格里斯储备金的价值时，底格里斯储备金中的CLAY代币和TTC代币将被用于清算未被结算的CFIAT债务，这种情况被称为终极清算。终极清算在以下情况下发生：

$$\text{总CFIAT债务} - \text{总质押品价值} > \text{终极清算率} * \text{底格里斯储备金价值}$$

设定终极清算率为90%，留出10%作为终极清算的缓冲。终极清算将持续进行直至终极清算的条件不再满足。

底格里斯储备金的持续增加能增加CDS抵抗市场波动带来的风险。

5.4 最大价格降幅

最大价格降幅是CDS可以承担的质押品价格的最大下降幅度。当CFIAT债务处于CFIAT债务上限且债务质押率达到其最大限额0.5时，系统能承担的价格降幅达到最大。根据以下等式，CDS可以承受质押品价格最多66.7%的瞬间下降。

$$1 - \text{CFIAT债务上限} / (\text{质押品价值} + \text{底格里斯储备金价值})$$

5.5 浮动服务费率



为了最小化系统风险，CDS采用浮动服务费率机制，服务费率随产生的CFIAT债务率相关。当系统中产生少量CFIAT债务时，系统风险较小，服务费率相对较低。随着更多CFIAT债务的产生，系统的潜在风险增加，服务费率也随之提升。

CFIAT债务率定义为当前产生的CFIAT债务与CFIAT债务上限之间的比率。

$$\text{CFIAT债务率} = \text{CFIAT债务} / \text{CFIAT债务上限}$$

服务费率按未偿还CFIAT债务的百分比计算。在浮动服务费机制中，服务费率随着CFIAT债务率的增加而增加。服务费率与CFIAT债务率之间的关系如下所示：

$$\text{服务费率 (\%)} = 0.01 * 18 ^ { (\lfloor 10 * \text{CFIAT债务率} \rfloor / 10) } + 0.015$$

上述公式中，服务费率随着CFIAT债务率以0.1的步长增长，增长幅度服从指数级分布。当CFIAT债务率在0到0.1之间时，服务费率为2.5%，当CFIAT债务率达到1时，服务费率达到19.50%。服务费率与CFIAT债务率之间的关系如下图所示。

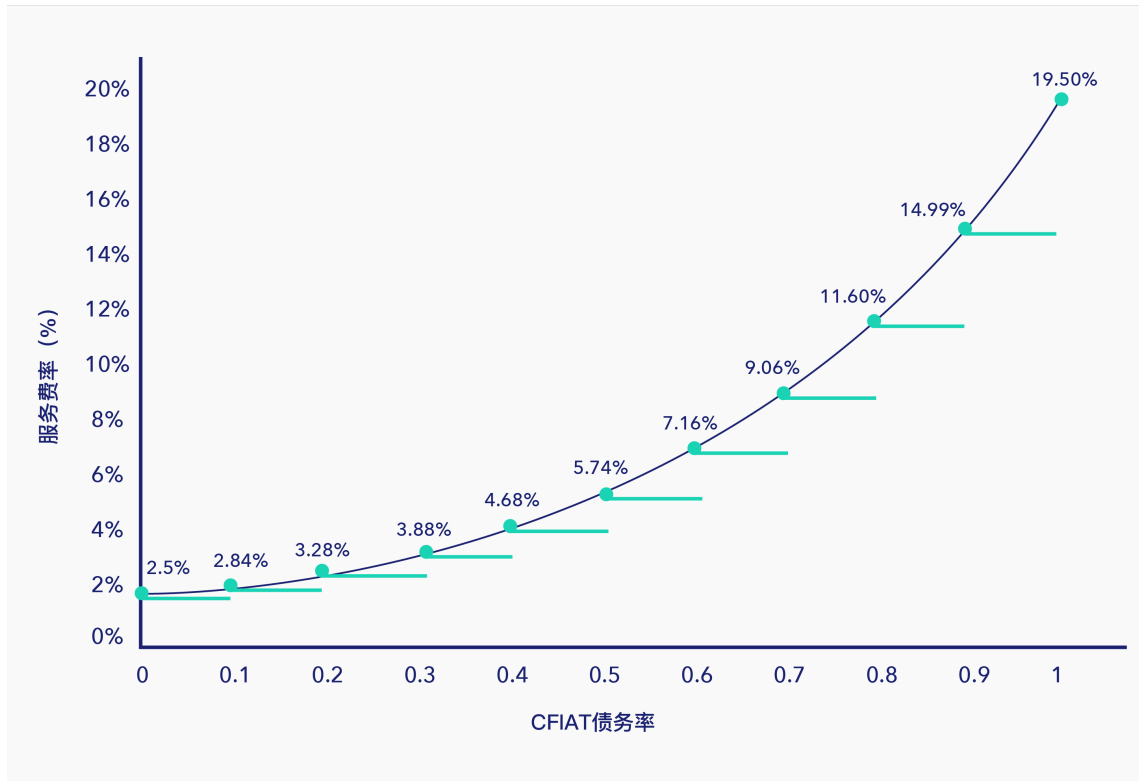


图4. 服务费率与CFIAT债务率的对应关系

随着底格里斯储备金价值的增长，CFIAT债务上限随之增加，这会导致CFIAT债务率下降，随之而来的是CDS服务费率的降低。

与其他由代币持有者控制服务费率的去中心化金融服务相比，CDS的服务费率由去中心化的智能合约管理，能为用户提供稳定且可预测的服务费。在CDS中，服务费率被用于控制系统的风险，去中心化的系统会在风险增加时，根据逻辑自动增加服务费用，以降低系统风险。

5.6 月度维护费用



在每月月底，底格里斯储备金的一小部分，包括CLAY储备金和TTC储备金，将被扣除并分配给TTC基金会作为月度维护费用。

具体而言，每月的维护费用使用以下公式计算：

$$\text{月度维护费用} = 0.2\% * \text{上月储备金余额}^{10} + 20\% * \text{当月储备金增长}^{11}$$

Clay储备金和TTC储备金每月扣除的维护费用将分别计算。

5.7 多资产质押

早期CDS只接受TTC代币作为质押品，TTC基金会正在制定多资产质押解决方案，其他TST-20代币，如CLAY令牌和ACN代币（由橡果协议发布的TST-20代币），可在未来被接受为质押品。它将为代币提供稳定性，并使TTC平台长期受益。当此类其他TST-20令牌被接受为底格里斯议定书的质押品时，我们也将更新底格里斯奖励计算的模型。

¹⁰ 上月储备金余额定义为上个月最后一天23:59 (UTC) 的底格里斯储备的余额。

¹¹ 当月储备金增长定义为当月第一天00:00 (UTC) 与当月最后一天23:59 (UTC) 之间的余额的正差额。在负差异的情况下，它被定义为0。



06

使用场景示例

我们来看一下Tanya，她是一个对TTC乐观的TTC代币持有者，以下是Tanya是如何使用底格里斯协议服务的。

场景1：通过质押TTC代币获取奖励

Tanya希望持有她的TTC代币一段时间，起初，她自己为TTC超级节点投票并获得一些投票奖励。

现在，Tanya在TSS智能合约中质押她的TTC代币，并从中获取每日奖励。Tanya发现，TSS给她带来的奖励比她自己投票奖励多出近7%¹²。

场景2：质押借贷

¹² 根据最新统计数据，超过150,000,000个TTC代币用于TTC共识投票，投票奖励的平均回报率约为17.69%。SAVE可以在第一年为用户提供预计的24.76%的投票回报率，比普通用户的投票奖励高出7.07%。



现在Tanya需要贷款来满足她的日常需求，但她不想出售她的TTC代币。她向CDS质押了20,000个TTC代币，然后生成了价值10,000个TTC代币（约900美元）的CUSD，她用新生成的CUSD支付了租金。

当她在一个月内收到下一笔薪水时，Tanya偿还了CFIAT债务和服务费，并取回了质押的20,000个TTC代币。让我们看看Tanya在两种不同情况下需要为CDS支付的服务费。

情况1. CDS推出后第一年

Tanya在CDS推出后的第一年就使用该服务，此时CDS用户相对较少。尽管Tanya需要支付2.5%¹³的服务费，但令她惊讶的是，当她取回质押的20,000个TTC代币¹⁴时，非但不用支付费用，还获得了额外的TTC代币奖励。事实上，当Tanya使用CDS时，她获得了底格里斯奖励计划中第一级用户的身份¹⁵。底格里斯奖励计划为Tanya提供了第一级底格里斯奖励，其中包括扣除使用CDS的服务费后的365.9TTC代币的净回报。

情况2. CDS推出后第四年

¹³ 假设CFIAT债务率小于0.1。

¹⁴ 当块周期在第一年内时，SAVE的投票的预期回报率为24.76%。

¹⁵ 有关详细信息，请参阅[04 底格里斯奖励计划](#)。



Tanya在CDS推出后的第四年使用该服务，CDS用户相对较多，服务费率增加为5.74%¹⁶。当她取回质押的20,000个TTC代币时，她欠系统94.35个TTC代币作为服务费，但她只需支付27.45个TTC代币价值的费用，因为TSS¹⁷的投票奖励涵盖了大部分服务费。

因此，与传统的借贷服务相比，Tanya能够以低得多的成本获得贷款。

场景3：线上/线下支付

使用底格里斯借记卡，Tanya在支持该服务的商店为她的父母购买礼物，而无需将她TTC Connect中的CUSDT转换为法定货币，她的所有交易信息和历史记录都记录在她的TTC Connect帐户中供她检查。

情景4：杠杆交易

Tanya质押了价值2万美元的TTC代币并生成了价值10,000美元的CUSDT。接下来，她用新生成的CUSDT在加密货币交易所购买了价值10,000美元的TTC代币。利用价值2万美元的TTC代币，现在Tanya拥有了价值约30,000美元的TTC代币（扣除交易费）。

¹⁶ 假设CFIAT债务率为0.5。

¹⁷ 在TTC共识中，出块奖励作每年减半。在第四年，SAVE的投票预期回报率为4.07%。



她可以随时出售TTC代币并支付价值10,000美元的CFIAT债务及其服务费，以解锁和取回其原始资产（价值20,000美元的TTC代币）。



07 总结

底格里斯协议致力于为TTC生态系统内的用户提供高效便捷的去中心化金融服务。CDS让用户有机会在不失去其资产所有权的情况下获得资产的流动性，TSS让用户通过质押其资产来获得低风险的稳定奖励。

所有底格里斯协议服务都是去中心化的，并由智能合约管理。这种自治治理可以规避人为错误和故意违规行为，透明且相互关联的服务为系统及其货币提供了更大的稳定性。

稳定高效的服务不仅仅为TTC生态系统提供了可扩展性，同时为广大用户提供了真实可行线上线下使用场景。从长远来看，随着越来越多的资产被质押并在底格里斯协议中，底格里斯协议将更加稳定，从而加速TTC生态系统的大规模扩展。



08

IMPORTANT INFORMATION

PLEASE READ THIS DISCLAIMER SECTION CAREFULLY. IF YOU ARE IN ANY DOUBT AS TO THE ACTION YOU SHOULD TAKE, YOU SHOULD CONSULT YOUR LEGAL, FINANCIAL, TAX OR OTHER PROFESSIONAL ADVISOR(S).

The Project Documents in their current form are circulated by the CLAY Token Vendor for general information and to invite feedback only on the Project, the Tigris Protocol, the tokens of the Tigris Protocol and their functions, and the CLAY TGE as presently conceived, and is subject to review and revision by the directors of the CLAY Token Vendor and/or advisors of the CLAY Token Vendor. Please do not replicate or distribute any part of the Project Documents without this Section in accompaniment. The information in the Project Documents, including information set forth below, may not be exhaustive and no part of the Project Documents is intended to create legal relations with a recipient of the Project Documents or to be legally binding or enforceable by such recipient against the CLAY Token Vendor. An updated version of the Project Documents may be published at a later date and to be announced by the CLAY Token Vendor in due course.



PLEASE READ THIS SECTION AND THE FOLLOWING SECTIONS ENTITLED "DISCLAIMER OF LIABILITY", "NO REPRESENTATIONS AND WARRANTIES", "REPRESENTATIONS AND WARRANTIES BY YOU", "CAUTIONARY NOTE ON FORWARD-LOOKING STATEMENTS", "THIRD PARTY INFORMATION AND NO CONSENT OF OTHER PERSONS", "TERMS USED", "NO ADVICE", "NO FURTHER INFORMATION OR UPDATE", "RESTRICTIONS ON DISTRIBUTION AND DISSEMINATION", "NO OFFER OF INVESTMENT OR REGISTRATION" AND "RISKS AND UNCERTAINTIES" CAREFULLY.

While we make every effort to ensure that any material in the Project Documents is accurate and up to date, such material in no way constitutes the provision of professional advice. The CLAY Token Vendor does not guarantee, and accepts no legal liability whatsoever arising from or in connection with, the accuracy, reliability, currency, or completeness of any material contained in the Project Documents. Potential purchasers of CLAY tokens ("**CLAY Purchasers**") should seek appropriate independent professional advice prior to relying on, or entering into any commitment or transaction based on material published in the Project Documents, which material is published purely for reference purposes alone.

The CLAY tokens are proprietary cryptographic tokens designed to function as the native utility token used in the Tigris Protocol.

The Project Documents do not constitute or form part of any opinion or any advice to purchase, sell or otherwise



transact in CLAY tokens and the fact of presentation of the Project Documents shall not form the basis of, or be relied upon in connection with, any contract or decision to purchase CLAY tokens.

Any agreement as between the CLAY Token Vendor and you as a CLAY Purchaser, and in relation to any sale and purchase, of CLAY tokens is to be governed only by a separate document setting out the terms and conditions (the "**CLAY TGE Terms**") of such agreement. In the event of any inconsistencies between the CLAY TGE Terms and the Project Documents, the former shall prevail.

There are risks and uncertainties associated with the CLAY Token Vendor, the Project Group, the Project, the CLAY tokens, the CFIAT, the TTC Coins, the Tigris Protocol, and the CLAY TGE. Please refer to the Section entitled "Risks and Uncertainties" set out at the end of the Project Documents.

The Project Documents, any part thereof and any copy thereof must not be taken or transmitted to any jurisdiction where distribution or dissemination of the Project Documents is prohibited or restricted.

No part of the Project Documents is to be reproduced, distributed or disseminated without including this Section and the following Sections entitled "Disclaimer of Liability", "No Representations and Warranties", "Representations and Warranties by You", "Cautionary Note on Forward-Looking Statements", "Third Party Information and No Consent of Other Persons", "Terms Used", "No Advice", "No Further Information or Update", "Restrictions on Distribution and



Dissemination”, “No Offer of Investment or Registration”, and “Risks and Uncertainties”.

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To the maximum extent permitted by the applicable laws, regulations and rules, the CLAY Token Vendor shall not be liable for any direct, indirect, special, incidental, consequential or other losses of any kind, in tort, contract or otherwise (including but not limited to loss of revenue, income or profits, and loss of use or data), arising out of or in connection with any acceptance of or reliance on the Project Documents or any part thereof by you.

No Representations and Warranties

The CLAY Token Vendor and/or the Project Group does / do not make or purport to make, and hereby disclaims, any representation, warranty or undertaking in any form whatsoever to any entity or person, including any representation, warranty or undertaking in relation to the truth, accuracy and completeness of any of the information set out in the Project Documents.

Representations and Warranties by You

By accessing and/or accepting possession of any information in the Project Documents or such part thereof (as the case may be), you represent and warrant to the CLAY Token Vendor and the Project Group as follows:

- a. you agree and acknowledge that the CLAY tokens do not constitute shares or securities of any form, units in a business trust, units in a collective investment activity scheme or any other form of regulated investment or investment product in any jurisdiction;



b. you are not an Excluded Person;

c. you are fully aware of and understand that you are not eligible and you are not to purchase any CLAY tokens if you are an Excluded Person;

d. you agree and acknowledge that the Project Documents do not constitute prospectuses or offer documents of any sort and are not intended to constitute an offer of shares or securities of any form, units in a business trust, units in a collective investment scheme or any other form of regulated investment or investment product in any jurisdiction, or a solicitation for any form of regulated investment or investment product, and you are not bound to enter into any contract or binding legal commitment and no cryptocurrency other than those provided for in the Project Documents or other form of payment is to be accepted on the basis of the Project Documents;

e. you agree and acknowledge that no regulatory authority has examined or approved any of the information set out in the Project Documents, no action has been or will be taken by the CLAY Token Vendor to obtain such approval under the laws, regulatory requirements or rules of any jurisdiction and the publication, distribution or dissemination of the Project Documents to you does not imply that the applicable laws, regulatory requirements, or rules have been complied with;

f. you agree and acknowledge that the Project Documents, the undertaking and/or the completion of the CLAY TGE, or future trading of CLAY tokens on any cryptocurrency exchange, including the TTC DEX, shall not be construed, interpreted or deemed by you as an indication of the merits of the CLAY Token Vendor, the Project, the CLAY tokens, the CLAY TGE, and the Tigris Protocol;

g. the distribution or dissemination of the Project Documents, any part thereof or any copy thereof, or acceptance of the same by you, is not prohibited or restricted by the applicable laws,



regulations or rules in your jurisdiction, and where any restrictions in relation to possession are applicable, you have observed and complied with all such restrictions at your own expense and without liability to the CLAY Token Vendor;

h. you agree and acknowledge that in the case where you wish to purchase any CLAY tokens, CLAY tokens are not to be construed, interpreted, classified or treated as:

i. any kind of currency other than cryptocurrency;

ii. debentures, stocks or shares issued by the CLAY Token Vendor, the Project Group, or any other person or entity;

iii. rights, options or derivatives in respect of such debentures, stocks or shares;

iv. rights under a contract for differences or under any other contract the purpose or pretended purpose of which is to secure a profit or avoid a loss;

v. securities;

vi. units or derivatives of units in a business trust;

vii. units in a collective investment scheme; or

viii. any form of regulated investment or investment product;

i. you are legally permitted to participate in the CLAY TGE and all actions contemplated or associated with such purchase, including the holding and use of CLAY tokens;

j. the amounts that you use to purchase CLAY tokens were not and are not directly or indirectly derived from any activities that contravene the laws and regulations of any jurisdiction, including anti-money laundering laws and regulations;

k. if you are a natural person, you are of sufficient age and capacity under the applicable laws of the jurisdiction in which



you reside and the jurisdiction of which you are a citizen to participate in the CLAY TGE;

l.you are not obtaining or using CLAY tokens for any illegal purpose;

m.none of:

i.you;

ii.any person controlling or controlled by you;

iii.if you are a privately-held entity, any person having a beneficial interest in you; or

iv.any person for whom you are acting as agent or nominee in connection with this CLAY TGE,

is a senior foreign political figure, or any immediate family member or close associate of a senior foreign political figure.

A “**senior foreign political figure**” is defined as a senior official in the executive, legislative, administrative, military or judicial branch of a government (whether elected or not), a senior official of a major political party, or a senior executive of a foreign government-owned corporation, and includes any corporation, business or other entity that has been formed by, or for the benefit of, a senior foreign political figure.

An “**immediate family**” of a senior foreign political figure typically includes such figure’s parents, siblings, spouse, children and in-laws.

A “**close associate**” of a senior foreign political figure is a person who is widely and publicly known to maintain an unusually close relationship with such senior foreign political figure, and includes a person who is in a position to conduct substantial domestic and international financial transactions on behalf of such senior foreign political figure;



n. if you are affiliated with a non-U.S. banking institution (“**Foreign Bank**”), or if you receive deposits from, make payments on behalf of, or handle other financial transactions related to a Foreign Bank, you represent and warrant to the CLAY Token Vendor that:

i. the Foreign Bank has a fixed address, and not solely an electronic address, in a country in which the Foreign Bank is authorized to conduct banking activities;

ii. the Foreign Bank maintains operating records related to its banking activities;

iii. the Foreign Bank is subject to inspection by the banking authority that licensed the Foreign Bank to conduct its banking activities; and

iv. the Foreign Bank does not provide banking services to any other Foreign Bank that does not have a physical presence in any country and that is not a regulated affiliate;

o. you have such knowledge and understanding of the operation, functionality, usage, storage, transmission mechanisms and other material characteristics of cryptocurrencies, blockchain-based software systems, cryptocurrency wallets or other related token storage mechanisms, blockchain technology and smart contract technology so as to be able to evaluate the risks and merits of the Project, the CLAY tokens, and the Tigris Protocol, and correspondingly any purchase of the CLAY tokens;

p. you are fully aware and understand that in the case where you wish to purchase any CLAY tokens, there are risks associated with the CLAY Token Vendor, the Project Group, the Project, the CLAY tokens, the Tigris Protocol and the CLAY TGE;

q. you bear the sole responsibility to determine what tax implications purchasing CLAY tokens may have for you and you agree not to hold the CLAY Token Vendor or any other person



involved in the CLAY TGE liable for any tax liability associated with or arising therefrom;

r. you agree and acknowledge that neither the CLAY Token Vendor nor the Project Group is liable for any direct, indirect, special, incidental, consequential or other losses of any kind, in tort, contract or otherwise (including but not limited to loss of revenue, income or profits, and loss of use or data), arising out of or in connection with any acceptance of or reliance on the Project Documents or any part thereof by you;

s. you waive the right to participate in a class action lawsuit or a class wide arbitration against the CLAY Token Vendor and/or any person involved in the CLAY TGE and/or with the creation and distribution of CLAY tokens or the Tigris Protocol; and

t. all of the above representations and warranties are true, complete, accurate and non-misleading from the time of your access to and/or acceptance of possession the Project Documents or such part thereof (as the case may be).

Cautionary Note on Forward-Looking Statements

All statements contained in the Project Documents, statements made in press releases or in any place accessible by the public and oral statements that may be made by the CLAY Token Vendor, the Project Group, or their respective directors, executive officers or employees acting on behalf of the CLAY Token Vendor or the Project Group (as the case may be), that are not statements of historical fact, constitute "**forward-looking statements**". Some of these statements can be identified by forward-looking terms such as "**aim**", "**target**", "**anticipate**", "**believe**", "**could**", "**estimate**", "**expect**", "**if**", "**intend**", "**may**", "**plan**", "**possible**", "**probable**", "**project**", "**should**", "**would**", "**will**" or other similar terms. However, these



terms are not the exclusive means of identifying forward-looking statements. All statements regarding the CLAY Token Vendor, the Project Group, and/or the future outlook of the industry which the CLAY Token Vendor and the Project Group are in are forward- looking statements. These forward-looking statements, including but not limited to statements as to the CLAY Token Vendor, the Project Group and other matters discussed in the Project Documents regarding the CLAY Token Vendor and the Project Group are matters that are not historic facts, but only predictions.

These forward-looking statements involve known and unknown risks, uncertainties and other factors that may have an impact on or adversely affect the CLAY Token Vendor and/or the Project Group, the Project, the Tigris Protocol, or the use of the CLAY tokens. These factors include, amongst others:

- a.changes in political, social, economic and stock or cryptocurrency market conditions, and the regulatory environment in the countries in which the Project Group conducts its business and operations;
- b.the risk that the Project Group may be unable to execute or implement the Project;
- c.changes in interest rates and exchange rates of fiat currencies and cryptocurrencies;
- d.changes in the anticipated growth strategies and expected internal growth of the Project Group and the Project;
- e.changes in fees payable to the Project Group in connection with its businesses and operations or on the Project;



f. changes in the availability and salaries of employees who are required by the Project Group to operate its business and operations;

g. changes in preferences of users;

h. changes in competitive conditions under which the Project Group operates, and the ability of the Project Group to compete under such conditions;

i. changes in the future capital needs of the Project Group and the availability of financing and capital to fund such needs;

j. war or acts of international or domestic terrorism;

k. occurrences of catastrophic events, natural disasters and acts of God that affect the businesses and/or operations of the Project Group;

l. other factors beyond the control of the CLAY Token Vendor and/or the Project Group; and

m. any risks and uncertainties associated with the CLAY Token Vendor, the Project Group, the Project, the CLAY tokens, the Tigris Protocol and the CLAY TGE.

All forward-looking statements made by or attributable to the CLAY Token Vendor, the Project Group, or persons acting on behalf of the CLAY Token Vendor and/or the Project Group, or relating to the Tigris Protocol are expressly qualified in their entirety by such factors. Given the risks and uncertainties that may cause the eventual outcome to be materially different from that expected, expressed or implied by the forward-looking statements in the Project Documents, undue reliance must not be placed on these statements. These forward-looking statements are applicable only as of the date of the Project Documents.



The CLAY Token Vendor, the Project Group, and/or any other person do not represent, warrant, and/or undertake the contents in those forward-looking statements, and the eventual outcome may differ materially from those anticipated in these forward-looking statements.

Nothing contained in the Project Documents is or may be relied upon as a promise, representation or undertaking relating to the CLAY Token Vendor and/or the Project Group, or the Tigris Protocol.

Further, the CLAY Token Vendor and the Project Group each disclaims any responsibility to update any of those forward-looking statements or publicly announce any revisions to those forward-looking statements to reflect future developments, events or circumstances, even if new information becomes available or other events occur in the future.

Third Party Information and No Consent of Other Persons

The Project Documents include information obtained from various third party sources ("**Third Party Information**"). The consent of the publishers of the Third Party Information has not been sought for the inclusion of the Third Party Information in the Project Documents and such publishers are therefore not liable for the Third Party Information. While the CLAY Token Vendor and the Project Group have taken reasonable action to ensure that the Third Party Information have been included in their proper form and context, the CLAY Token Vendor, the Project Group, and/or their respective directors, executive officers, and employees acting on its behalf, have not independently



verified the accuracy, reliability, completeness of the contents, or ascertained any applicable underlying assumption, of the relevant Third Party Information. Consequently, the CLAY Token Vendor, the Project Group, and/or their respective directors, executive officers, and employees acting on their behalf do not make any representation or warranty as to the accuracy, reliability or completeness of such information and shall not be obliged to provide any updates on the same.

Terms Used

To facilitate a better understanding of the CLAY tokens being offered for purchase by the CLAY Token Vendor, and the businesses and operations of the Project Group, certain technical terms and abbreviations, as well as, in certain instances, their descriptions, have been used in the Project Documents. These descriptions and assigned meanings should not be treated as being definitive of their meanings and may not correspond to standard industry meanings or usage.

Words importing the singular shall, where applicable, include the plural and vice versa and words importing the masculine gender shall, where applicable, include the feminine and neuter genders and vice versa. References to persons shall include corporations.

No Advice

No information in the Project Documents should be considered to be business, legal, financial or tax advice regarding the CLAY Token Vendor, the Project Group, the Project, the CLAY tokens, the Tigris Protocol, or the CLAY



TGE. You should consult your own legal, financial, tax or other professional advisor regarding the CLAY Token Vendor, the Project Group, the Project, the CLAY tokens, the Tigris Protocol, and the CLAY TGE. You should be aware that you may be required to bear all risks of any purchase of CLAY tokens for an indefinite period of time.

None of the advisors engaged by the CLAY Token Vendor and/or the Project Group has made or purports to make any statement in the Project Documents or any statement upon which a statement in the Project Documents is based and each of them makes no representation regarding any statement in the Project Documents and to the maximum extent permitted by law, expressly disclaims and takes no responsibility for any liability to any person which is based on, or arises out of, any statement, information or opinions in, or omission from, the Project Documents.

No Further Information or Update

No person has been or is authorized to give any information or representation not contained in the Project Documents in connection with the CLAY Token Vendor, the Project Group, the Project, the CLAY tokens, the Tigris Protocol, or the CLAY TGE and, if given, such information or representation must not be relied upon as having been authorized by or on behalf of the CLAY Token Vendor and/or the Project Group. The CLAY TGE shall not, under any circumstances, constitute a continuing representation or create any suggestion or implication that there has been no change, or development reasonably likely to involve a material change in the affairs, conditions and prospects of the CLAY Token Vendor and/or the Project Group or in any



statement of fact or information contained in the Project Documents since the date hereof.

Restrictions on Distribution and Dissemination

The distribution or dissemination of the Project Documents or any part thereof may be prohibited or restricted by the laws, regulatory requirements and rules of any jurisdiction. In the case where any restriction applies, you are to inform yourself about, and to observe, any restrictions which are applicable to your possession of the Project Documents or such part thereof (as the case may be) at your own expense and without liability to the CLAY Token Vendor and/or the Project Group.

Persons to whom copies of the Project Documents have been distributed, disseminated, or provided access to or who otherwise have the Project Documents in their possession, shall not circulate it to any other persons, reproduce or otherwise distribute the Project Documents or any information contained herein for any purpose whatsoever nor permit or cause the same to occur.

No Offer of Investment or Registration

CLAY tokens are not intended to be and should not be construed to constitute shares or securities of any form, units in a business trust, units in a collective investment scheme or any other form of regulated investment or investment product in any jurisdiction. The Project Documents do not constitute prospectuses or offer documents of any sort and are not intended to and should not be construed to constitute an offer of shares or securities of any form, units in a business trust, units in a



collective investment scheme or any other form of investment, or a solicitation for any form of investment in any jurisdiction. No person is bound to enter into any contract or binding legal commitment in relation to the sale and purchase of the CLAY tokens and no cryptocurrency (other than those provided for in the Project Documents) or other form of payment is to be accepted on the basis of the Project Documents.

THE CLAY TGE (AS REFERRED TO IN THE PROJECT DOCUMENTS) IS INTENDED FOR, MADE TO OR DIRECTED AT ONLY PERSONS WHO ARE NOT EXCLUDED PERSONS. ACCORDINGLY, YOU ARE NOT ELIGIBLE AND YOU ARE NOT TO PURCHASE ANY CLAY TOKENS IN THE CLAY TGE IF YOU ARE AN EXCLUDED PERSON.

No regulatory authority has examined or approved of any of the information set out in the Project Documents. No such action has been or will be taken under the laws, regulatory requirements or rules of any jurisdiction. The publication, distribution or dissemination of the Project Documents does not imply that the applicable laws, regulatory requirements or rules have been complied with.

Risks and Uncertainties

Prospective CLAY Purchasers should carefully consider and evaluate all risks and uncertainties associated with the CLAY Token Vendor, the Project Group, the CLAY tokens, the Project, the Tigris Protocol, and the CLAY TGE, and all information set out in the Project Documents and the CLAY TGE Terms prior to any purchase of the CLAY tokens. If any of such risks and uncertainties develop into actual events,



the business, financial condition, results of operations and prospects of the Project, the Tigris Protocol, the CLAY Token Vendor and/or the Project Group could be materially and adversely affected. In such cases, the value or the trading price of the CLAY tokens may be indirectly impacted.

Please refer to the risks and warnings set out in the CLAY TGE Terms before deciding to purchase CLAY tokens. It should be noted the aforementioned list of risks and warnings is not exhaustive. Accordingly, prospective CLAY Purchasers should not place undue reliance on these statements.