

## DRAFT SUBMISSION

### **UN Climate Change Secretariat and Gold Standard Collaboration, Technology solutions to reduce the barriers to measuring, quantifying and certifying impacts (including IT based platforms and blockchain based solutions)**

On March 14, 2017 the first worldwide carbon credit transaction using blockchain technology was performed in **DAO Integral Platform for Climate Initiatives (DAO IPCI)** between The Russian Carbon Fund and Aera Group. Transaction rewards 1 year of blockchain application for carbon markets development undertaken by DAO IPCI team of blockchain and environmental markets experts.

[DAO IPCI](#) is a Decentralized Autonomous Organization operating, sustaining and developing the Integral Platform for Climate Initiatives, smart contracts and blockchain technology-based independent ecosystem designed for carbon market instruments, including carbon compliance units', carbon-offset credits, other environmental mitigations credits, environmental assets, rights and liabilities registration, accounting and transaction data.

On behalf of DAO IPCI Team, Aera Group and Russian Carbon Fund, we 'd like to provide input to 'Technology solutions to reduce the barriers to measuring, quantifying and certifying impacts (including IT based platforms and blockchain based solutions)':

The minimum necessary functionality of DAO IPCI blockchain ecosystem is already in place. The smart contracts, modules and [DAO IPCI dApp](#) interfaces are adjusted according to the requirements of a pilot climate program – the Integrated Program for Climate Initiatives of the Russian Carbon Fund.

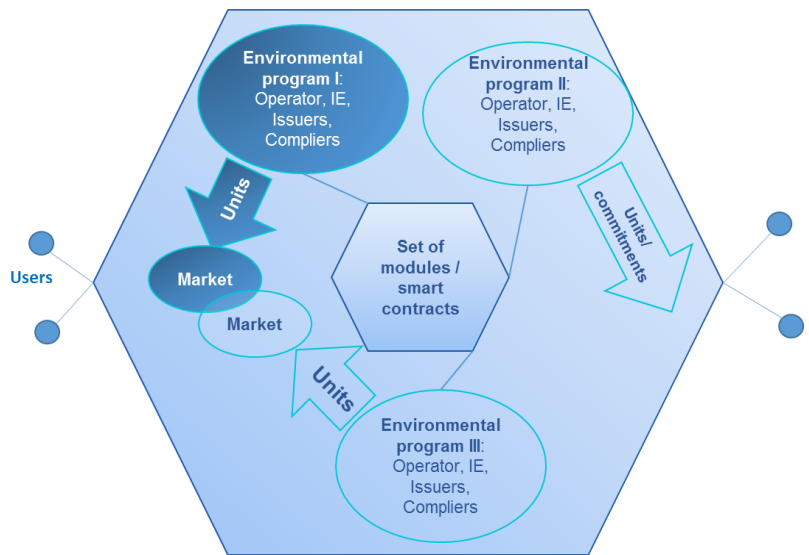
Integrated Program for Climate Initiatives Operator represents the pilot climate program operating in blockchain ecosystem. The blockchain ecosystem itself does not have a central authority. Instead, we are working on a non-profit foundation to be established to provide for coordination of the stakeholders.

## Figure: DAO IPCI Architectonics

Environmental Programs' Operators, Independent Entities (IE), Issuers and Compliers :

- Are operating under independently sustained program rules and may interact within the integral digital ecosystem,
- Register assets, rights and liabilities and issue asset-based environmental units using common set of adjustable and ready-to-use modules and smart contracts.

DAO IPCI provides unlimited access of the Users to DAO IPCI data and markets



**To make our input as practical as possible we hereby provide answers to actual questions of our potential stakeholders:**

1. How does an entity gain access to the blockchain?

*DAO IPCI is essentially an open source software and a public blockchain ecosystem. Access is controlled by the Operator of specific climate (environmental) program. The Operator of specific climate program controls access of the Issuers, IE, Compliers. For now, there is only one operator. For an independent climate program, it would be only logical to create an independent Operator, which determines the rules, including the rules and rights for access. DAO IPCI Team is in place to provide support.*

2. Carbon registry accountholders usually are subject to Know-Your-Customer (KYC) background checks. Can the blockchain prevent the unapproved users from accessing the system and taking ownership of carbon units?

*The current Operator's policy is liberal and does not restrict transactions of environmental units. It only restricts trading of the units that are intended for offsetting. Trading of such units is impossible. However, DAO IPCI development team has taken into consideration KYC issues very seriously. Therefore, we have created technical ways to identify, control the access and rights of specific groups of users.*

*Our development plan includes using Uport identity system (<https://www.uport.me/>) or other options according to specific operator's requirements.*

3. Can users choose to remain private to others in the blockchain?

*Technically, it is up to the Operator to disclose the identity of the participant to the others or not. For now, once the identity is registered in the blockchain it is public. If the Operator does not register the*

*identity in DAO IPCI, he can store it “offline” and keep it private. However, we have taken possibility of confidential interaction into consideration, and technically, once it is required it is possible to encrypt some of the data and create encrypted identity or smart-contracts storage.*

4. What advantages does the blockchain ecosystem have over current registry systems?

*Under current Operator requirements, there is no registry as a legal entity. It has been substituted by automated coordinated procedure performed by the Operator, Issuer and Independent Entity, and the result (the registry entry) goes to transactions log (History). Though, technically it not a problem to introduce a registry holder. For example, - instead of an Independent Entity. As a result, there are almost no transaction costs related to registration procedures, There is almost no risk of losing or changes in the registration data*

5. In what way are transaction costs “minimized” compared to the current way the traditional registry operates?

*As there is no registry as a legal entity, there are no fees for registry operations subject t correct performance of the Operator, the Issuer and the Independent Entity*

6. What happens if a user makes an error (eg, issues the wrong volume, retires the wrong VCUs)?

*The inherent characteristic of blockchain is that the transaction cannot be “rolled back” or “erased”. The procedure should consist of the following: recognizing the error and performing new transactions to correct it. In critical cases the smart contract that was used to perform wrong transaction with the units may be deactivated (“killed”), and consequential transactions with the units related to this specific contract would be impossible*

7. How are transactions sent/accepted between users? Are transactions ever in a “pending” status? What role does the “Security Reserve Contract” play in transactions?

*The units may be transferred between the users or traded in the market. Current Operator has not introduced restrictions, except for restriction to trade the units intended for offsetting. Those may only be retired.*

*However, we have developed a prototype Market Agent Contract, which would allow only the identified and approved market agents to perform transactions with the units. It is up to the Operator to introduce this option*

*Transactions in the market are in the pending mode until approved and confirmed by the parties.*

*Security Reserve Contract is intended mainly for removals by sinks, when you have to keep certain percentage of removals in reserve is case the forest for example is exterminated by fire*

8. If a carbon units are issued or retired on the blockchain ecosystem, can the record of the issuance or retirement be reflected the other databases?

*Yes, the API for such operations is ready to be installed. We have developed it for airline operators to have the carbon footprint offsetting transactions of the passengers and of the company to be reflected in their databases*

Security issues

9. Who maintains this system? E.G., updates, etc.

*DAO IPCI Team is working on the blockchain ecosystem architecture, IT, carbon market, and legal issues.*

*As for specifically blockchain technology development you may refer to Github repository at <https://github.com/airalab/DAO-IPCI> and Alralab Team, <http://aira.life/our-team/>, a part of DAO IPCI Team*

10. The whitepaper “INTEGRATED PROGRAM FOR CLIMATE INITIATIVES” states, “Previous attempts to create carbon emissions-related blockchain systems and cryptocurrencies have failed due to the lack of high quality underlying to support them.” Why exactly did earlier attempts fail and how is the situation different now?

*Carboncoins, Greencoins, Solarcoins are cryptocurrencies. They are not asset-based and do not imply issuance of verified environmental units under control of specific climate programs. The principal difference is that actual verified mitigation outcomes-based units have entered the public blockchain and blockchain-based market for them may be created in compliance with specific climate program requirements on the basis of a set of smart-contracts and modules required.*

11. What kind of security concerns exist with blockchains?

*If a user or group of users acquire very large computing capacity they theoretically can take control over the data, over the blockchain. With currently over 30 thousand participants of the Ethereum Net participants (nods) the cost to acquire sufficient computing capacity would be at least USD 80 million.*

*On our end, we require principal participant to have the nods with a full blockchain downloaded (synchronized), and may provide access to Microsoft Azure Virtual Servers for these purposes.*

*In the most critical situation with a very low probability, hardfork option would be available to restore operations from the last block with a correct data.*

*There is a risk of DDOS attacks, which result in slowing down the transactions. However, these attacks also require expenses and Ethereum Net miners identify the attacking participants and block their transactions.*

12. How to treat blocks that go offline?

*The blocks are “offline” until they are confirmed by a sufficient number of nods in the network. The transaction is considered to be settled with the correct “online” block, when there is sufficient number of confirmations from the nods (participants). Etherscan proposes 12 confirmations to be sufficient.*