Carbon Accounting and Certification Working Group

Join our Peer Programming Call-In

We have a bi-weekly Peer Programming Zoom call for developers on Mondays at 9 AM US Pacific time (UTC-07:00 America/Los Angeles.)

We're currently implementing the Utility Emissions Channel use case together.

If you're interested, please check the calendar for the next call.

Mission

In recent years, businesses and investors have become increasingly aware of climate change and are now taking positive action to stop it. A great example is Microsoft's initiative to become carbon neutral and eventually carbon negative. For these initiatives to succeed, multiple parties including institutional investors, major corporations, supply chain partners, environmentalist groups, government regulators, and the general public must now work together, sometimes for the first time. This new collaboration in turn requires exchanging data and building trust across traditional boundaries.

Today, this is simply not possible. Some data, such as utility bills or shipping records, are held in those institutions' data siloes and are tedious to get. Most data, though, is just not available. Most products involve multiple materials and activities to manufacture and distribute, and the data for the carbon footprint of their raw materials and activities are not available. As a result, we have to rely on broad aggregates of national economic output instead of carbon emissions data for any particular organization or individual.

While it may never be possible to account for the exact carbon emissions of a single unit of product, just like it's not possible to account for the exact value or cost of single unit of production in traditional accounting, we need to improve the quality of carbon accounting so that it could be reasonably done at an organizational or a personal level. Only by doing so could we attribute climate impact and encourage climate action properly.

To do, every member of a supply chain would need to be able to get the data they need to make reasonable carbon emissions calculations of their products and services, and then be able to publish those emissions for the products and services they make. Those emissions calculations should be made by trusted auditors, or software developed by such trusted parties. Then customers or users in the next step of the supply chain could use those emissions data to calculate their own emissions. This would require transmitting data across a large number of organizations and activities across multiple industries and supply chains. The challenge is one of scope and scale.

Blockchain or distributed ledger technologies (DLT's) are specifically designed for such scenarios and could be the backbone of any multi-party collaboration on climate change. They allow values, in this case of carbon emissions, to be tokenized and transferred through a supply chain of multiple, disparate parties across traditional national and industry boundaries. These tokens of carbon emissions could be attached to invoices and give us hard data based on real transactions for emissions calculations.

The mission of this working group is to identify how DLT's could improve corporate or personal carbon accounting and make carbon accounting and certifications more open, transparent, and credible. We're here to help

- Businesses and organizations take action on climate change by making the process easier and less costly.
- Certifying entities do more by streamlining the process for verifying corporate climate action.
- General public and consumers trust corporate climate action with open and transparent analysis.
- Investment community gain deeper understanding of corporate sustianability claims through more data and analysis tools.

We will work closely with the Standards - WG as part of understanding the standards and implementing the technologies for climate accounting and the Consumer Disclosure Working Group to implement applications that consumers could use to understand their own CO2 emissions footprint.

Active Members

To help group members meet and interact with each other, people are welcome to add their contact information and your time zone to this page so that other participants can contact you directly.

Adding your name here is optional and is not required to be a part of the group.

To add your name in the directory below: you will need edit access to the wiki, and for this you need to get a free Linux Foundation ID. Once you have your LF ID (which you can use to log in the chat as well) you can log in and edit the table below with your information. After adding your name here, please also subscribe to the group's mailing list and post an introduction there so other group members can get to know you. You can also join the CA2 Hyperledger Chat group and make a personal introduction there and join the regular group meetings.

Name	Company	Time Zone
Si Chen	Open Source Strategies, Inc.	US Pacific
Christiaan Pauw	Nova Institute	

Robin Klemens	private interest	
Lam Nguyen	Connectivity AAU	
Kamlesh Nagware	Snapper Future Tech	
vaneet sharma	peregrines computing s.l	

Get Involved

Subscribe to the Climate Sig mailing list for updates and meetings.

Meetings

We're part of the Hyperledger Climate Action and Accounting SIG Meetings – See you there!

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Scope

The current scope of this working group includes:

- Identifying standards for corporate climate accounting and certifications.
- Providing recommendations on how DLT's could complement or improve current industry processes.
- Implementing open source DLT software to demonstrate climate accounting and certifications.
- Promoting awareness and positive action in the larger Hyperledger and DLT community.
- Educating other stakeholders on the value of DLT's and Hyperledger in climate change.

Background

Many companies today are starting to account for and limit their climate impact, going as far as trying to achieve carbon or climate neutrality. These corporate initiatives often involve several steps, including:

1. Auditing their greenhouse gas (GHG) emissions.
2. Establishing a plan for reducing the company's own emissions over time.
3. Purchasing carbon offsets to offset current emissions to achieve carbon neutrality.
4. Obtaining a carbon neutrality certification from a certifying entity.

Yet these steps are often difficult for the companies themselves and at times met with skepticism from the general public. This is because of the challenges of **data** and **trust**.

The Challenge of Data

A GHG emissions audit requires data from a lot of different sources, many outside of the company. The Greenhouse Gas Protocol specifies three levels of emissions: Scope 1, 2, and 3, covering direct energy use (fuel burned on site), indirect energy use (energy purchased from utilities), and all other significant activities of the business, including products purchased, transportation of goods, travel and commuting of employees, and leased assets.

The problem is that most emissions come from activities which are hard to get data for. At a minimum, the data would need to come from every part of the business, from purchasing to manufacturing to facilities management to human resources. More importantly, it also involves data from a company's supply chain partners, such as the manufacturers of its products or components. Those manufacturers, in turn, may not have this data or may not wish to publish it for competitive reasons. Finally, what data could be obtained must often be gathered manually and entered into spreadsheets.

The high cost or complexity of obtaining the data has limited both the quantity and quality of data used for emissions calculations. Often, emissions are calculated based on national and industry level economic activity–for example, the plastics industry in the United States as a whole. If that's case, how do we know what the emissions of a particular plastic packaging manufacturer are? And what incentive does that particular manufacturer have to reduce its emissions?

The Questions of Trust

At the same time, it's not hard to see why the general public could be skeptical of a company's climate action claims. After all, as consumers,

- Can we trust the data that the company has provided?
- Can we trust judgement calls, made by either the company or a certifying entity, about which activities are not relevant and thus do not require data and auditing?

- How do we know if the company is in fact working on its emissions reduction plan?
- Can consumers and investors trust that the certifying entity is objective?

Meanwhile, institutional investors such as the Net Zero Asset Owner Alliance or Climate Action 100+ have a different trust issue. They are used to more in-depth analysis and independent verification of companies' claims, and carbon neutral certifications do not have the same level of detail as other financial ratings they are accustomed to. For example, when investing in bonds, it's not enough that one rating agency, such as Standard & Poors or Moody's, considers a bond "investment grade." They typically require credit ratings by more than one rating agency, and the ratings are in tiers from AAA (highest credit quality) to CCC (high default risk.) As climate neutrality becomes important to them, they would probably demand the same level of detail in ratings of corporate climate action.

Why Blockchain (DLT's)

Fortunately, blockchains or distributed ledger technologies (DLT's) are by design made for solving these issues. With blockchains, we can

- Automate data collection from a large number of sources, as is typical in supply chains.
- Maintain audit trail of immutable records, so that emissions calculations could be verified later without relying on one central repository.
- Create trust in CO2 emissions accounts as they are transacted across industrial and national boundaries, where no trusted central repository exists.

Why Open Source

By making the source code available, we make the carbon emissions accounting and certification process transparent, so that all stakeholders could see what went into it. This increases the trust in the results.

Furthermore, by creating free tools for gathering data, we allow certifying entities to focus on analysis, while reducing the cost of carbon emissions reporting so that it becomes possible for companies of all sizes, instead of just the large, public ones.

Why Hyperledger

Hyperledger is a permissioned ledger, so it could be used to share data and transact between trusted parties. This protects confidential business data from unauthorized parties.

Because it's a permissioned ledger, Hyperledger also does not need the proof-of-work algorithms used by public ledgers such as Bitcoins. This makes it both much faster and more energy efficient. Since our goal is to stop climate change, we would naturally want an energy efficient technology to do it with.

How to Get Started

While carbon audits and certifications are complex, a lot of data could be obtained automatically now. For example, utility bills, corporate travel, server usage, and shipping data could all be obtained by API calls. See the Carbon Accounting and Certification Minimum Viable Product (MVP) to learn more about how we're building software for climate accounting.