OrbMB
TECHNOLOGIES CORP.

Data Value Accounting's Sustainable Energy Implications

GROWING NET R.O.I.
Recognizing the Intrinsic Nature of Data in the Taxonomy of Data

We have changed how we gather data. Our accounting ought to reflect this.

SECTION Page

A) LINKS

Read Me first
1-page 'Nature of Data' re-think: orbmb.com/wp-content/uploads/2018/12/dhuer-data-for-tax-credits-2017-2018.pdf

Break-out of the method
orbmb.com/hearth/whitepaper-01-summary/

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B) WHAT IS THE SUSTAINABLE ENERGY PROFITS SOLUTION?

Preamble : *We have changed how we gather data. Our accounting ought to reflect this.*

We have become a globally-networked information society. Data generating is democratized and every person produces a vast byte-by-byte footprint. But we do not fully account for the costs and expenses that we incur. We are not effective or efficient, and this threatens the foundation of our society and its future.

The solution originated in a fundamental re-think about 'real world' impacts that flow from our use of data. This is about the (intrinsic) nature, (monetized) value, and (government, societal, community assigned) worth of data entered in the accounting ledger: what "new information" actually *is*. This led to a 'first principles' re-think about pre-gathered data, data immediately prior to entry, and then managed data after entry into the ledger. This produced a process to partially convert data creation expenses to an Asset to be compensated for donating data that produces social benefits defined by an investing program, including energy sustainability. This flows from the idea that for accounting purposes, data is exactly like Wind, Hydro, and Solar Energy. It must be constantly created and captured to have utility. It is ephemeral; a renewable resource; and it is the transitory nature of the resource that lets us develop new strategies to manage it.

Solution: "Data Value Accounting" - Recording 'Data Value' & 'Data Energy Value' in the Ledger

The solution is a ledger recording process for cloud collected data. The traditional Income Statement is upgraded to reflect the paramount importance of all phases and aspects of data. The change reflects that fact that data that is taken up (to enter the process of taking on 'assigned financial value') must *exist* to be *assigned* a financial value to *have* utility.

The new method produces the means to finance volunteer (volunteer-donated data) costs, volunteer*ed* (donated) costs, and new micro-businesses that produce “a social good” [benefits to society] and “desired outcomes” [private & public-private Return-on-Investment, desire to have net positive results from 'opportunity cost' choices, etc.].

The framework originated from a desire to get paid with Tax Credit Incentives. *But it does not require Tax Authority participation*. The structure could get independently used by non-State actors for mutual benefit (non-profits, social agencies, for-profit corporations, public-private partnerships, private donors, faith communities, and other agencies).

Generating Sustainable Energy Profits

Data is generated and transmitted by energy-hungry electronic systems that produce waste emissions. Transmission Tower counts are forecast to grow from four million in 2018 to five million by 2020[1]; inviting even more growth. We need to manage billions of data points; this requires global incentive to predict and manage data's energy cost.

The traditional ledger was created in the age of paper, pencils, ink, and quill pens. The upgrade reflects our newfound capacity to vacuum up vast quantities of data. One of the surprises of the re-think is to observe that this novel method produces incentive to pre-value the energy expended to obtain the data we desire to capture. The innovation uses the changes to assign a fiat (franc, rupee, dollar) or equivalent value (token, cryp, credit, tithe, in-kind) to data streams that we never considered previously; until now, this has been considered impractical *and* intellectually 'impossible'.

Background Notes

(a) 'Nature of Data' Root Innovation: This is a new way to look at the relationship between data, finance, tax law, energy cost, volunteering, work, employment, ROI, opportunity cost, supply chains, operations, and ecological services.

(b) Efficient Data Gathering has no Value for Charitable Tax Donations: This originated when searching for ways to get paid when asked to donate unpaid labour to government entities. My proposal was to obtain equivalent Net Credit Value that could be leased, sold, traded or exchanged for cash. In many countries (including Canada), tax authorities do not allow donors to offer Labour for charitable tax credit. Labour is *functional value* delivered separately from *asset value*, where the Calculation is: Appraised Asset Value (minus) Labour Expense to deliver Asset (equals) Net Credit Value

[1] '(Nov 2018) https://www.businesswire.com/news/home/20181121005458/en/Global-Telecom-Tower-Market-2017-2018-2025--

to claim credits. But there is a challenge when we want to donate Data. It is classed as an Asset, and Labour is necessary to create it, but *Data Labour* is defined as *un-claimable* value. An Expense, not an Asset. This led to the re-think.

(c) The re-think led to reorganizing our understanding of data: to a framework where Data has Six Phase States, *emanating* from A [("wild")]; thence converting through to E (Fiat Utility Value) and F (Tax Credit Value). This reflects the understanding that New Data must be "made Real" to be "converted to Utility" to be a Asset. It is the "making real" that is Labour activity. *Creating Data* means collecting entirely new ("Wild" and "Raw") Information that has intrinsic value; where Labour Cost to collect Wild Data is arguably separate from Labour Expense to convert Raw Value to Utility Value.

> The cost to collect ("make real") the Raw Assets (a new "Cost of Data Collected" line item); and
> The use of that value ("convert" the Raw Value) of that Asset to a Utility Value ("Expense").

(d) This led to analysing the effects on 'recording fiat value' in the standard Income Statement: Which produces need to reflect the change in the Income Statement. The change is a process where newly-generated ('wild/raw') data is used to convert Labour Expense to a twinned entity that is *both* a Real Property Asset and a Labour Expense.[2] We use new line-items, *Cost of Data Collected* and *Net Equivalent Data Value*. The root calculation culminates in [(w + x) – y = z].

(e) The process thereby creating opportunity to deliver financially-useful spread-rewards: Using metadata loggers, sensor data loggers and powerful algorithms to record the data for delivery to ledgering computers.[3] Data Loggers are electronic devices that detect the passing flow of electronically-detected and/or generated data.

> *Metadata:* Digital Data (email, chat, G-Suite, Office 365, Linux, etc.) that is gathered as users and organizations perform work.
> *Sensor Data:* Electronic devices (RFID, sound, accelerometers, etc.) that detect the passing flow of data sources.
> *Data Loggers:* Electronic devices that actively and/or passively record the passing flow of data.

(f) What happens when we re-think about how data originates? The reformulation has deep implications. It has universal utility because it flows from re-thinking the intrinsic nature of data, not the laws of a specific country. It offers opportunities to create incentives to efficiently produce, filter, deliver and consume data; and the energies required to generate and manage related infrastructure. It adds 'effectiveness' measures to personal, organization, national, and global accounts. It offers a framework for create Universal Basic Income earning structures as new technologies threaten to remove humans from many job categories. And it incentivizes the move to sustainable energy sources because Data is exactly like renewable energy: investors can use this to convert Net Generated Value of Energy (which is ephemeral) to be equivalent to Data (also ephemeral), to determine which feedstocks offer highest sustainable profit.

(g) What is a "social good" and what is the desired profitability target? These are defined by parties to the transaction.

(h) "Uncertainties Design" (UD)[4]: The metrology and framing of the data to be gathered will become vitally important to bring "measurement uncertainties" into the design of 'data harvesting' plans and user instructions.[5] This suggests need for (g1) an entirely new educational discipline, and (g2) Big Data certification programs, reaching across all levels of society from an early age.[6] UD will touch the entirety of *Data Pre-Harvest Planning* to design Uncertainty Measures for Accounting, Finance, Investing, Trading, Governance, Long-Term Climate Strategies, Local Ecosystems Stewardship, Weather, Energy, Food, Forests, Water, Sustainable Cities, Economics Forecasting; and various other subjects.

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[2] Converting *Labour Expense* to *Real Property Assets* shocked accountants. It is not supposed to be possible.

[3] Financial spread: monetizable range which has a highest value and a lowest value. Traditional methods of data recording can be used, also.

[4] In February 2019, researchers reported the results of a study which concludes that "students would probably exercise better judgement, say the researchers, if they knew more about measurement uncertainties and had a framework for determining when a difference is significant—things that are often left out of the curriculum." http://physicsbuzz.physicscentral.com/2019/02/more-data-can-lead-to-worse-decisions.html?m=1 and https://journals.aps.org/prper/abstract/10.1103/PhysRevPhysEducRes.15.010103;

[5] 06 February 2019 at 17:21 pm by email: Proposing "Uncertainties Design" to (a) the researchers: Prof. Dr. Burkhard Priemer (Humboldt-Universität zu Berlin: priemer@physik.hu-berlin.de), Dipl.-Biol. Wiebke Musold (Humboldt: wiebke.musold@physik.hu-berlin.de), Herr M.Sc. Karel Kok (Humboldt: karel.kok@physik.hu-berlin.de) and Prof. Amy Masnick (Hofstra University: Amy.M.Masnick@hofstra.edu): Ibid.: http://physicsbuzz... and (b) George Verghese, PhD (Curtin University, Interior Architecture & Design).

[6] ' "Given what's at stake, the researchers recommend that teachers make time to include these concepts in science classrooms and beyond." ' "Since data, and judging the quality of this data, is becoming so prominent in our everyday lives, teachers in all subjects should try to incorporate this into their classes," they write."

Example of an Application to Energy Profitability

When the desired "social good" is to cut Greenhouse Gas (GHG) Emissions

The social outcome we need to obtain is low-emission energy sources. Since energy expenditure is also a measure of the emissions of the method by which the energy is generated, this simultaneously means we can use the framework to assign (monetized) value and (social) worth to the emission sources that produce each local dataset.

We can assess and predict value and energy cost of the data we desire to gather. The usual approach is to vacuum up every scrap we can, and sort it out afterwards. But that increasingly poses downside risk including ballooning energy and ecological cost as snowballing local ability to exponentially collect more data replicates across society. Example: crypto-currency mining centres "are essentially spaces filled with computers that solve math problems in exchange for digital currency."[7] Quebec (a region rich in renewable hydroelectric energy) found that crypto-miners were grabbing so much power at the low local rate that industry had brownouts. Miners were using approximately one quarter of supply.[8]

(a) Calculation Overview: The solution can be used as the conduit through which data is tracked for emissions' costing purposes. The solution produces net profitability measures to compare emissions of all energy-generated data sources; which produces investor incentive to execute full-cost comparison of energy feedstocks:

(highest data value) + (lowest energy cost) = highest sustainability ROI = (desired social good) + (desired profit target);

where:

(highest data value) = (intrinsic = nature) + (monetized = value) + (societal benefit = social good);

And:

(social good {in this use case}) = (Lowered[9] GHG Emissions) + (Socio-Economic Benefits) + (Profitability)

Fig.1.0 - Using framework to calculate *Emission Net Return-on-Investment* Goal

This is the *Net Return-on-Investment* goal of investors adopting the method. Using locally-sourced data additionally *keeps local* the ability to make locally-driven decisions about energy feedstocks used to sustainably generate it.

> *Imagine a 'renewable energy services corporation' in Puerto Rico:* A solar panel installation company might deliver "tax creditable beneficial values" to major public sector employers (utilities, emergency services). *These could include:* cutting dependence on steady imports of 'high emission' energy supplies, creating incentive to cache emergency sets of panels to forestall energy risks during future disasters (these will occur), and reducing O&G feedstock pollution. *An example of tradable data?* The homeowner members of a "Neighbourhood Energy Benefits Association" use their solar panels as proof of delivering the Social Good of a monetized spread of low vs. high emission sources.

(b) What are the Incentive Outcomes? The recording process produces financial incentive to disaggregate and measure data collected by all telecom systems, data-aggregation systems, and the billions of devices connected to those systems. Using the tool as our guide we obtain profit incentives to design programs to replace high-emission with low-emission sources, which is necessary to cut global warming:

> (a) financial incentive to define the datasets we need to compare & assign value measures to complex emission sources at the neighbourhood-and-household level;
> (b) a practical tool to design and apply fiscal incentives to measure & cut all GHG emission sources.

We can use the framework to assign *equivalent fiat value* to:

- *Energy costs required to generate and process each dataset collection (computing, human labour).*
- *Energy required to collect data from local collection sources (house, factory, farm, generating station, telecom tower, etc.).*
- *Property owners and tenants will have incentive to cut data-generation cost (utilities' expense) at device-emissions level.*

[7] https://www.cbc.ca/news/canada/montreal/cryptominers-are-stuck-in-limbo-as-hydro-qu%C3%A9bec-suspends-requests-for-power-1.4644682
[8] https://thenextweb.com/hardfork/2018/05/30/quebecs-electricity-deal-with-cryptocurrency-miners-makes-sense/
[9] Or conceivably "lowest possible".

Background Notes - GHG Emissions Example

(a) The Fiduciary Challenge: One of the challenges in tackling climate change is the disconnect between the cost to accurately measure emissions' impact and the requirements demanded of companies. Traditionalists might often view investing in climate matters as a job for government; it is a challenge for private for-profit corporations because in many countries, especially the larger industrial states, corporations are legally required to maximize shareholder financial ROI ahead of all other considerations. They could be sued and/or taken-over if the stricture gets ignored.

(b) Climate-change investors are shifting the conversation: By looking to get GHG emissions data disaggregated[10]; but there is a systemic challenge: traditional Pareto Analysis suggests that it is too costly to disaggregate down to device-level. In part, this conundrum flows from the era of creation of double-entry accounting (Luca Pacioli, 1494) which used simple data sources (counting, arithmetic, memory; recording using paper & ink); and society's tendency to stick with what we know. Our fundamental data sources have changed. We need to account for this. But can we create profit incentives to obtain comparative data? Also, how do we treat original data, to be able to use it as financial data?

(c) The strategy here: To say that by changing the nature of data (to recognize that it must be *deemed* to exist to be monetized) creates the means to change how we account for it. Tweaking the standard Ledger and Income Statement is a practical way forward. It is *this* that creates the means to offer incentives to cut GHG emissions down to device-level.

Broad Applications
Driven by Profitability and Technological Feasibility, producing Environmental And Socio-economic Benefits

If farmers donate micro-climate data to their co-operative, it obtains net compensation value by supplying aggregated data to weathercasters. If homeless people need earnings to become housed, we create innovative apps to finance education, coaching, and micro-financed small businesses. To protect species from extinction, we can engage poachers with steady earnings. We could profitably fund village well filtration systems; creating earnings for each village, too.

Can new definitions enlarge the nature and accounting definitions of income, in a way that produces profitable sustainability? The answer is "Yes!" - When we change how we think about the true nature, value, and worth of the data that we generate every day. And use it to create billions of incentives to cut high-emission sources of energy supply.

C) DOES IT FIT INTO ONE OF THE INVESTMENT AREAS?

OrbMB's Data Value Accounting process innovation helps the environment in a profitable way. The solution has direct impact to Responsible Consumption and Production, producing spin-offs touching Clean Water & Sanitation; Affordable & Clean Energy; Industry, Innovation & Infrastructure, Sustainable Cities and Communities including micro-lending.

Technological Feasibility: Yes - The solution requires a shift in thinking about the nature of data; and the creation of rewards to invite uptake. It adds new definitions and line-items to widely-used 'real world' Income Statement and Accounting Ledger recording methods. It adds to two new items to the Income Statement; and these can be applied with or without regulatory involvement. The simplest being to reference use as an Income Statement footnote.

Environmental and Socio-economic Benefits: Yes - The solution has direct positive impact on the environment, and produces both direct (earnings) and indirect (spin-off) socio-economic benefit, without any significant negative impact transferred. It is useful in every country because it flows from re-thinking the intrinsic nature of data entered in a ledger, *not* the nature or rules of law specific to countries. This invites global uptake by charitable organizations, governments, public-private partnerships, companies, investors, and in arrangements between private parties.

Profitability: Yes.

[10] February 7, 2019 / 1:25 AM: Gwladys Fouche via Reuters, World's largest wealth fund to press firms for climate data at AGMs, reported via The Daily Pitch: VC, PE and M&A, Pitchbook.com, February 11, 2019: https://www.reuters.com/article/us-norway-swf-idUSKCN1PW0VC