



empati



Building a system to commoditise carbon abatement

Most of the focus in carbon thus far has been on carbon removal, either through nature-based or technology-enabled carbon capture.

Sadly, removal is only a solution for a minority of the issue. We have built the technology to price carbon abatement, with 99.5% accuracy against the relevant counterfactual to stop carbon entering the atmosphere in the first place.

Removal vs abatement:

in the context of a 50 gigatonnes per year reduction plan by 2050.

Removal (Heuristic)

The most bullish forecasts claim a potential run-rate of removal of 10Gt by 2050.

This represents a maximum solution of 10-20% of the problem itself, contingent on accelerating technology learning curves for DAC etc. (which are by no means certain).

The removal pathway is driven by rule-of-thumb heuristics making subjective comparisons that are proxy-rich, unsuited to international comparisons, inconsistent through time, and unmeasurable against real-world outcomes.

Removal cannot give rise to high probability or accuracy around measurement or fungibility. Without a fungible unit of negative carbon, commoditisation is impossible.

Without commoditisation a global carbon marketplace for cash, futures and other derivatives, both chemical and financial, is impossible.

Abatement (Probabilistic)

This needs to do the heavy-lifting to make up the 40-50Gt shortfall left by removal. It can be defined, analysed, reported and verified in real-time against the counterfactual in a probabilistic and impartial way.

The process can guide the policy of countries, relationships between countries and economic blocs, sector focus and international carbon trade with a level of precision sufficient to displace the \$50 trillion fossil fuel market.

This will drive value for money and international carbon trade opportunities, causing a profitable transition in a world driven increasingly by AI procurement.

There is potential for a hyper-efficient atomized carbon marketplace, ushering in a zero marginal cost energy system. It can be the technology to accelerate the global adoption of Articles 6.2 and 6.4 at the scale needed to achieve globally.

Creating a fungible unit of carbon abated

Empati technology is designed to forecast, measure, report, verify and constantly update carbon abated to 99.5% accuracy under P90 conditions.

We call this Carbon 995 and it is the ultimate measure of purity for carbon abatement. Carbon 995 acts as the Gold Standard for purity in the same way as 999 is the millesimal maximum for pure Gold, Silver, Palladium or Platinum.

To achieve this, power generation and power consumption need to be netted off second by second and compared to a defined counterfactual. This is done through continuous monitoring of these values using our Carbon PROV technology.

This approach is the basis of our probabilistic solutions, which contrasts to the heuristic approach of those advancing carbon removal solutions.

A history lesson in millesimal markets



International convention marks for fineness are part of the Convention on the Control and Marking of Articles of Precious Metals, an international treaty signed in 1972 to ensure safeguards for the cross-border trade in precious metal articles. The convention introduced the Common Control Mark (CCM), a conformity mark indicating that the article of precious metals has been controlled in accordance with the convention's requirements.

The CCM is recognised by all member countries in the convention. Articles bearing the CCM - along with the national Assay Office Mark, the responsibility mark, and the fineness mark - are accepted without further testing or marking by any of the contracting states, if they qualify for the domestic market.



The finenesses recognised under the convention include

Platinum: 999, 950, 900, 850 Gold: 999, 916, 750, 585, 375

Palladium: 999, 950, 500 Silver: 999, 925, 800

A history lesson in millesimal markets



Adoption of this millesimal approach created fungible marketplaces in these precious metals and has since seen widespread acceptance, allowing for great cash market volume and a futures and options market.

We predict the same for our new millesimal product of a universal tonne of carbon abatement.

PROV moderated Carbon Project Finance:

a template for risk and return assignment, with continuously updated forecasting capability while ensuring transparent and unambiguous incentives monitoring.

Financier Charlie Munger once famously said, “Show me the incentive and I’ll show you the outcome.”

When today’s voluntary carbon markets pay forward 60% of a carbon removal project’s 10 year carbon reduction forecast - in cash, on day one, with no penalties - the litany of fraud, poor record keeping, and failed carbon removal projects should sadly surprise no-one.

Based on years of experience in the renewables sector, we have built a PROV-based carbon project finance model with real-time updating and AI fraud detection. Trillions of dollars of capital flow through standard PF financing, without any of the drama we see in carbon removal projects today.

Our next stage of development is to turn the entire model into an origination algorithm and to build in fraud detection with variance and counterfactual explanation.



Extend the established project finance process to carbon forecasts and accounting

FEASIBILITY

DETAILED DESIGN

PROJECT DUE
DILIGENCE

PRE-CONSTRUCTION

CONSTRUCTION

OPERATION

Project Finance Process

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| <ul style="list-style-type: none"> ▪ Identify land and agree outline terms ▪ Grid availability and preliminary offer ▪ Initial system design including estimated energy output | <ul style="list-style-type: none"> ▪ Land secured ▪ Grid offer including infra upgrade costs ▪ Detailed system design ▪ PVSyst report at P90 ▪ EPC estimates ▪ O&M estimates ▪ Financial model | <p>Undertake full project due diligence (DD) process</p> <ul style="list-style-type: none"> ▪ Legal ▪ Financial ▪ Technical ▪ Environmental ▪ Insurance ▪ Market | <ul style="list-style-type: none"> ▪ Review design and update ▪ Material procurement packages ▪ EPC (construction) estimates ▪ Appoint EPC contractor | <ul style="list-style-type: none"> ▪ Complete construction ▪ Final technical testing and commissioning ▪ Project handover and construction warranties | <ul style="list-style-type: none"> ▪ Asset management ▪ O&M services ▪ Energy generation forecasts ▪ Energy generation actuals ▪ Variance analysis |
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Carbon Finance Process

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| <ul style="list-style-type: none"> ▪ Initial CO2 abatement appraisal ▪ Draft PDD ▪ Establish LCOCA | <ul style="list-style-type: none"> ▪ Empati CO2 "995" appraisal and rating ▪ Articulate MRV methodology ▪ Carbon PDD <ul style="list-style-type: none"> ◦ Tenor ◦ Volume of CO2 ◦ Monitoring process ▪ Carbon finance metrics <ul style="list-style-type: none"> ◦ CSCR ◦ CSRA | <p>Undertake full project due diligence (DD) process</p> <ul style="list-style-type: none"> ▪ Legal ▪ Financial ▪ Technical ▪ Environmental ▪ Insurance ▪ Market | <ul style="list-style-type: none"> ▪ Carbon abatement forecast ▪ Carbon abatement actuals ▪ Real-time carbon updates ▪ Variance analysis |
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Example carbon bond

10 Year \$10bn Carbon Bond

Price per Mt CO ²	\$50.00
Minimum Mt CO ² returned	200,000,000
Annualised Mt CO ²	20,000,000
CSCR @ 1.25 x	5,000,000
CSRA @ 6 months	10,000,000
Surplus Mt CO ² to equity	60,000,000
Value of Mt CO ² surplus	\$3.0bn

The background features a dark blue field with a pattern of circles and organic shapes. On the left, there are several solid blue circles of varying sizes. On the right, there are bright green shapes, including circles and larger, rounded, interconnected forms that resemble a stylized molecular or network structure. The overall aesthetic is modern and geometric.

THANK YOU