PERSEUS

Automating sustainability reporting

Enabling banks to accelerate net zero for every UK SME

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Contents

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1 https://creativecommons.org/licenses/by/4.0/

Vision

Perseus will help automate sustainability reporting for every small business in the UK to reduce emissions faster.

Perseus will make it easy to share accurate, assurable data sitting behind emissions calculations.

Mission

In its first phase, Perseus will automate access to SME electricity data. SMEs will be able to see the emissions from their energy use and share it with their banks to unlock green finance.

The UK Green Finance Strategy states:

Measuring and managing small and medium enterprises' GHG emissions

The UK government is working with Bankers for Net Zero, the British Business Bank and a range of industry stakeholders, to automate SME sustainability reporting on a national scale by creating a common data sharing platform for net zero data sharing – building on both Open Banking and Open Energy.

This will aid SME engagement with, and planning for, the transition to net zero. This programme will remove a major barrier that SMEs face in setting and working towards their net zero targets, as measuring, monitoring and managing their GHG emissions can prove time and resource intensive and thus deter them from their goal.

It will also help banks manage their own net-zero strategies, including managing risk and unlocking opportunities for access to capital."

Goal of this document

In the context of environmental information, comprehensive financial and non-financial reporting by organisations, we demonstrate the real-world implementation of a programme that can help unlock access to capital for SMEs, while materially reducing complexity and friction in reporting.

Using a radical collaborative, pre-competitive and open market approach, we highlight how this project complements ongoing international initiatives around standards, regulation and engagement in the race to net zero.

We present the substantial scope and complexity of what is needed, those involved, the progress made to date and plans for the future. We highlight challenges and opportunities and describe the process undertaken to rapidly convene, design and decide on actions. We show how the project's focus, its systems design, market architecture and its implementation elements will improve efficiency, unlock innovation (such as policy and regulatory progress, legal, technical and perception shifts and behavioural changes) and produce value

This document will aid your understanding of the transformative potential of data sharing and how its connection and use can be unlocked at scale; enabling it to act as a flow of evidence that informs action. While this includes a technology approach, it is not 'about' technology. Rather, it addresses designing the *conditions for success* that can enable experts, practitioners and organisations to create trust and impact through better access and use of the data needed to make informed decisions.

Audience

Our primary audience are decision-makers and their advisors who wish to understand how to **implement** change, using multi-sector collaboration and a joined-up, systemic approach to de-risk investment. This includes, but is not limited to, banks, policy makers, regulators, trade associations and commercial practitioners working on sustainable finance, corporate reporting, finance, carbon reporting solutions and supporting SMEs. Many of the principles and lessons herein are applicable beyond the scope described.

NB: where options are listed with considerations; **recommendations** are in **bold**.
All recommendations and decisions are prefixed with *must*, *should* or *could*.

1. Executive Summary

**"Go as far as you can see;
when you get there you'll be able to see farther"**

Thomas Carlyle

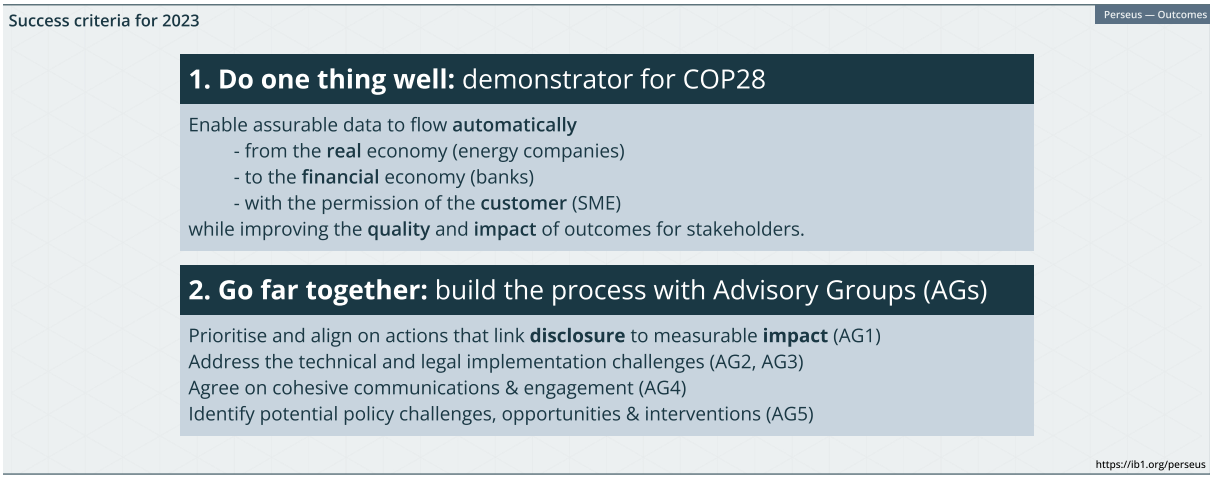
Over the past five months the Perseus project has delivered a cohesive, comprehensive and achievable set of definitions of user needs (reporting, legal, policy, technical), business cases, workable prototypes developed by partners and a prioritised roadmap for implementation. Perseus has also catalysed a code change by a key sector governance body.

We are in the midst of a systemic change where our financial economy and our real economy must join together to address our environmental challenges.

Today, we have a crisis of trust in carbon reporting – with dozens of standards, thousands of data silos, highly variable data quality and diverse approaches – confusion abounds. There are hundreds of initiatives attempting to address parts of this puzzle, but few geared towards a cohesive, market-wide implementation.

Trusted systems change requires different modes of collaboration, engagement and pace. Perseus is a groundbreaking initiative to **implement** change. It brings together the public and private sectors, standards bodies, trade associations, finance and businesses, to collaborate on delivery.

Whereas standards bodies focus on what must be reported, Perseus focuses on how. Its approach is outcome-based, iterative and concentrated on what must be done to deliver against fixed dates. Launched on 27th June 2023, its objectives for this year were:



Herein we describe why, how and what this has delivered so far and what is next.

2. Context

What's at stake?

There are more than 5.5 million SMEs in the UK, accounting for around half of the country's business greenhouse gas emissions.

There is no common process to follow when reporting emissions. Many reports are based on inaccurate estimates. SMEs' stakeholders, including banks and corporate customers, therefore, receive low-quality data that is not comparable or actionable.

As regulation drives mandatory reporting for banks (and others) of financed emissions (Scope 3, Category 15), there is a material risk that inaccurate reporting data will delay investment and a material opportunity that trusted data will accelerate it.

Emissions reporting is a burdensome process (in time and money). For SMEs this leads to disengagement, a lack of trust, concerns about costs, confusion over the number and type of solutions that exist and distractions from their core business. Many are losing trust in the processes and are disengaging or operating in silos.

Who is involved

The UK Government, leading sector trade bodies and non-profits are coming together to drive national engagement. Further, the international community is joining as observers to maximise the opportunities for shared learning, collaboration and global scale in the race to net zero.

B4NZ (the UK country chapter of the NZBA, part of UNEP FI and GFANZ) convened the high-level stakeholders. Icebreaker One (a non-profit) is leading implementation and operating the secretariat.

What are the needs of users?

The stakeholders that connect finance to net zero impact are complex and cross-sector. We begin by considering the user needs of each stakeholder in this complex ecosystem.

Key drivers linking automated reporting data and GHG emissions reduction

- High-quality, assured data capture with minimal effort enables improved carbon reporting.
- Automated analysis of energy consumption facilitates, targeted recommendations for decarbonisation and cost savings.
- Greater detail and assurance improve efficiency and reduce risks for banks, improving access to green finance.

Banks	As users of reports, banks need reporting to be based on assurable evidence so they can unlock billions of pounds in funding for the UK economy.
SMEs	SMEs need access to capital to deliver our net zero future with low cost and friction.
Software applications	To support both these users, consultants and application vendors need to deliver software solutions to support analysis and recommendations at scale. These application vendors require access to input data from a wide range of sources across the real economy.
Accountants and auditors	Finance professionals need to be able to provide assurance over the whole process and the underlying data.
Energy providers	The energy sector needs to know where the demands of its customers are going to intersect with funding, so they can use their capital allocation plans to greatest impact.
Standards bodies	Organisations that create standards and reporting frameworks need mechanisms to enable the implementation of their methodologies with low friction, in a comparable manner and with uniquity across sectors.
Government and regulators	Government and regulators need clear standards around which incentives, policies and regulation can be designed and implemented. These must balance risks and benefits and not inadvertently create negative impacts.
Society	As a country, we all need to know that we are moving rapidly and robustly to a demonstrable net zero future.

Our programme

To go far together, we have convened and will continue to convene all relevant stakeholders to co-design and agree how they want to implement automated reporting.

To do one thing well, the Perseus stakeholders agreed to **start with** the automation of Scope 2 reporting (using electricity data from UK smart meters) and to address all the elements in making this a reality (policy, legal, technical, operational).

Perseus is laying the foundations for a whole-of-market pre-competitive solution that will enable the automated flow of low-friction primary data. This data flow will be cohesive, assurable, comparable and lead to actionable emissions reporting. It will help inform investment decisions, enable targeted decarbonisation interventions, reduce reporting burdens and unlock green finance.

The point of starting with 'one thing', as is evident from this report, is that the degree of complexity is labyrinthine.

Our ambition is to use this 'one thing' to lay the foundations for scale. We know from Open Banking and Open Energy that there are common patterns that can be reused. Once the policy, legal, technical and operational 'rails' are in place, they can be used for other categories.

Done well, the approach may be scaled across 'input sectors' (e.g. all energy types, water, transport, agriculture, the built environment and beyond) and 'output sectors' (e.g. non-bank corporates, insurance, pension funds, impact investing, and asset management) and it can address Scopes 1, 2 and 3. It may reveal design patterns that can be applied 'upstream' (e.g. enterprise) and/or 'downstream' (e.g. consumer). However, 'boiling the ocean' will lead to failure.

It may also be the case that getting high-quality, continuous energy consumption and carbon intensity from a sufficiently large and diverse sample-set is 'good enough' for many applications. We will find out through delivery of the programme, based on its open collaboration to foster cross-sector, national and international conversations.

Our collaborative approach

The **Perseus Constellation** is a multi-disciplinary, multi-sector group of leaders and experts. Its mission is to design the 'rules of the game' to unlock assurable, reliable data flow that leads to comparable, meaningful reporting, which can be used to create personalised impact and investment plans for millions of businesses.

The **Perseus Implementation** is based on a tried and tested foundation that has delivered Open Banking and Open Energy. The implementation codifies the rules into a Trust Framework[2] that specifies how data can be used.

A core design principle of the Perseus Implementation is that it should do as little as possible. As such, it **is not** a database, a calculator, a standard or a framework. It is a scheme that connects those elements in a manner that is implementation-focussed, non-competitive with other initiatives and scalable.

The **Steering Group** convenes over a dozen non-commercial organisations and the UK Government, to oversee the programme. It is co-chaired by the British Business Bank and Icebreaker One.

There are five industry-led **Advisory Groups** working on the specific design and details of implementation. The outputs of these groups are reported back to the Steering Group for endorsement.

These groups agreed two measures of success for 2023:

1. **Do one thing well:** create a demonstrator that enables assurable data to flow automatically from the real economy (energy companies) to the financial economy (banks) with the permission of the customer (SME) and improve the quality and impact of outcomes for stakeholders.
2. **Go far together:** build the process that enables prioritisation of actions that link disclosure to impact, address the technical and legal implementation challenges, agree on cohesive communications and identify potential policy interventions.

2 https://ib1.org/trust-frameworks

Progress summary

Do one thing well: we now have a clear scope and tested market engagement. This document represents a key part of the demonstrator for COP28. The commercial and non-commercial partners have formally validated and endorsed the approach.

We have documented and determined the scope for work on:

a. The value case(s) for the banks, software applications, auditors and accountants, energy companies and SMEs.

b. The data flow across the value chain from the origin of the electricity, with its carbon intensity, through to the point of use (the SME) and then onto the carbon accounting applications, to the auditors and accountants to support compliant reporting for the banks using assurable data.

c. The alignment with the Partnership for Carbon Accounting Financials (PCAF) standards and the greenhouse gas (GHG) methodology. The time resolution for this data is at a 30-minute resolution on consumption and carbon intensity. We have identified over 1 million businesses in the UK that this first-phase solution could be applied to. We have identified and engaged with the challenge of sublet offices, where no national programme or approach exists.

We have also revealed some material challenges, which are substantial, but navigable.

This document demonstrates the scale of legal, policy and technical challenges. Commercial partners have created internal demonstrations of how the Perseus Implementation will function with their software applications. We have created a sandbox environment that demonstrates the technical infrastructure that enables secure data flow using a Trust Framework.

Go far together: we are sufficiently quorate and aligned to have confidence in our collaborative processes, discussions and consensus building. While instigated rapidly, we have robust programme management in place and are introducing detailed governance and reporting processes as part of this development.

We have successfully convened an exceptional Steering Group. Five banks have joined, one big four accounting firm, a global payments provider, the national smart meter data organisation, alongside competing data providers, services and software applications: these include representatives ranging from large multinational organisations to medium, small and startup businesses. Regulators have pro-actively engaged and the first foundational energy code change has been completed.

There is much more work to be done, however. To go far, we aim to create a cohesive implementation across the banking sector. A key target is, therefore, to engage with all major UK banks in 2024 and beyond. Similarly, all software applications are tactical actors in this ecosystem and, if all join the Perseus Implementation, then banks and SMEs will have de facto comparability.

Critical to this journey is for all stakeholders to adopt the principle that Perseus unlocks a pre-competitive landscape. Commercial competition must focus on analysis, insights and impact.

Impact: reducing risk

Impact questions considered during discussion included a wide range of topics, such as meeting regulatory requirements, increasing efficiency, improving accuracy and quality, enabling the development of new financial instruments, and reducing risk.

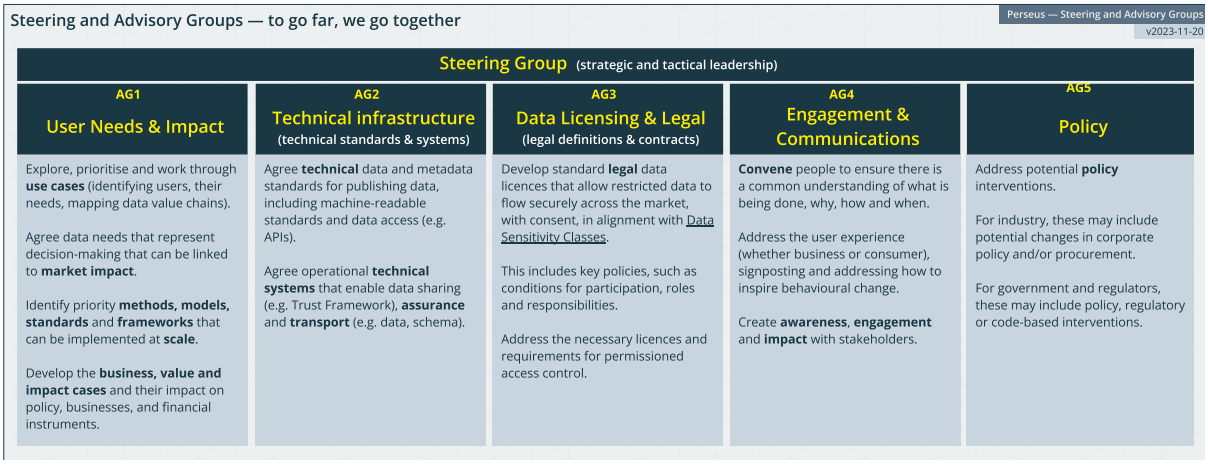
It was agreed that these are all value points in the programme. When asked to prioritise one, reducing risk was deemed the most significant across all stakeholders. A core risk is that if data is incomplete, inaccurate or of insufficient quality, the cost of capital will remain high and reduce lending potential. Further, poor quality data may undermine trust in reporting and impact market confidence. This can lead to restrictions on access to capital for SMEs net zero investments in either modelling the type of solution and its fit with the SME needs and/or the inability to lend to the SME due to lack of data.

To address these risks, the provision of assurable data must underpin the products and services and these solutions must enable sustainable lending that delivers demonstrable net zero outcomes. Priorities include:

- Automated analysis of energy consumption profiles to unlock targeted recommendations for decarbonisation actions. Confirming the suitability of interventions already in lending taxonomy and supporting those that are not.
- Detailed, granular data to facilitate the ability to coordinate with energy efficiency experts, unblocking the extension of decarbonisation services to SMEs.
- The use of automated data to allow automated assurance and de-risking on the regulation of reporting requirements (e.g. PCAF).
- Combining demand and tariff data to allow automated calculation of:
    - Inputs into automated reporting (e.g. SBTi)
    - Return on investment (RoI)
    - GHG emissions reduction (location-based)
- Verification and assurance
    - Definition of ‘verifiable’ and/or ‘assurable’ in the context of this application
    - Processes for data sharing to be independently verified by a third-party
    - Enabling machine-verified data coming from a trusted source that is part of the Perseus Trust Framework
    - Ensuring raw data can be independently verified by a third-party
- Driving decarbonisation through market-based calculation (green tariffs) by matching generation and demand data at half-hourly resolution.

There are many emergent examples of innovation, including new startups and services that create automated, personalised recommendations for SMEs, and new business models that are based on trustworthy and automated reporting. These will be further explored in 2024.

Advisory Group insights



Advisory Group 1 (AG1 on user needs and impact)
Engaged with over 50 stakeholders to deliver alignment and direction for the demonstrator, highlighted material, but navigable, challenges, addressed specific challenges to align on why, what and how reporting on electricity can be aligned.
AG1's work was foundational to the scope of work for other AGs.

Advisory Group 2 (AG2 on technical infrastructure)
Laying foundations via sub-working groups, such that the bulk of the foundational engineering questions are addressed.

Advisory Group 3 (AG3 on data licensing and legal)
Defining a clear high-level framing and scope of work.

Advisory Group 4 (AG4 on communications and engagement)
Defining how to communicate the project and lay the groundwork for engagement.

Advisory Group 5 (AG5 on policy)
Defining a clear high-level framing and scope of work.

Substantial progress has been made with the Retail Energy Code (Recco) to begin the process of allowing smart meter data to be used in the context of Perseus. The first component of the code changes required was initiated after project launch and approved in November 2023. Subsequent code changes are now understood and will be initiated in 2024. This is an important step in achieving a national-scale programme where data rights are unlocked to use the underlying data for the intended purposes. It also highlights the importance of non-profit leadership in initiating the changes. Commercial vendors submitting the same request would face substantial hurdles, but IB1's non-profit status, mission and umbrella positioning with Perseus was deemed a 'market enabler.'

Market-wide challenges for cohesive implementation

Material challenges include:

1. Communication

Clarity of communication on what Perseus is, what it is not and what is being done is an ongoing challenge. We accept that there has been some confusion around what Perseus is and is not. For example, it is not developing a new GHG Reporting Standard (this is for the standards bodies, such as PCAF, to define,). Similarly, Perseus is not a 'carbon calculator' as this would compete in the market. Carbon calculators are a key data user and constitute many of the Members.

Perseus is a structured approach to implementation. It is best referred to as a **Scheme** (not a Standard or a Framework), unlocking access to assurable data that meets the reporting requirements of standards bodies. It enables assurable data flow through supply chains, reducing risk, increasing efficiencies and addressing perceived greenwash.

2. Regulatory blockers

As noted above, sharing energy data is non-trivial. Our research shows that accessing energy data in the UK is more complex than accessing financial bank account data. This is mostly due to the complexity of the ecosystem and competing rules and regulations defined by multiple organisations.

3. Technical blockers

There is a requirement for unlocking access to data over the web for an API (application programming interface), a way for machines to talk to each other in a secure manner. While Smart DCC has substantial data and can provision certain types of data access, it is still exploring development of its own APIs. To address this for the demonstrator, we are creating a sandbox environment to enable permission-based sharing of data.

4. Roadmap to prioritise scope for future development

There are many competing priorities for 'what next.' For example, to address SMEs at scale requires deeper engagement with the energy sector (e.g. retailers) to ensure that access is possible for those without a Smart Meter and those in serviced offices. This can be addressed, in part, by solutions such as private sector companies provision (e.g. Demand Logic and Perse are members). Engagement with policy and trade body leaderships are key to ensuring that a digital divide does not lead to a net zero divide. The future work of AG1 will, by design, help to focus and prioritise the needs of the ecosystem as a whole and how SMEs, banks and intermediaries can ensure solutions are equitable.

Perseus in data

The number of stakeholders involved in the Perseus data value chain is substantial, and demonstrates that an open market requires a market architecture for decentralised data sharing.

UK Data	
Number of SMEs	5.5 million
Carbon/ESG solutions in the UK	Over 270
Electricity suppliers to SMEs in the UK	Over 100[3]
Banks and lenders	Over 100
SME smart meters addressable via national programme	Over 600,000[4]
Total non-domestic smart meters in the UK	Over 1.7 million[5]
Non-smart meters that can be retrofit to enable measurement	Over 500,000 (representing over 4B sq ft)
Perseus Constellation	
Total people directly involved (Steering and Advisory Groups)	Over 130
Steering Group members Steering Group observers	19 15
Commercial members (organisations)	27
Reach via events (audience)	40+ events (estimated 4,000+ people)
Reach (online)	Total online reach: tens of thousands 26 project posts (on ib1.org) and dozens of posts on socials with 1,500 average impressions per post. Third party posts (e.g. Retail Banker).

3 https://www.ofgem.gov.uk/energy-data-and-research/data-portal/retail-market-indicators
4 https://www.smartdcc.co.uk
5 https://www.statista.com/statistics/984677/installed-nondomestic-electricity-smart-meters-by-type-uk

External communications and events

All formal public communications are listed on the website at

https://ib1.org/tag/perseus/

B4NZ and IB1 have driven engagement and support through numerous high-profile conferences and speaking events. From industry conferences, such as the Climate Innovation Forum, Economist Sustainability Live, Innovation Zero, Edie 23 to global colleagues at the OECD Financing SMEs for Sustainability Summit and at COP27, IB1 and B4NZ have demonstrated the value of Perseus to a wide-reaching audience.

Speaking engagements in the past months include:

- London Climate Action Week Parliamentary Reception
- New York Climate Action Week panel
- DESNZ Committee Session
- OECD Financing SMEs for Sustainability Platform Summit, Paris
- OECD Summit
- Westminster Business Forum, Green Finance Session
- Both main UK political party conferences (Manchester, Liverpool)
- Parliamentary roundtable with Mexican policymakers at request of FCDO
- Parliamentary roundtable with Peruvian finance leaders at request of FCDO
- Innovation Zero
- ESG Data and Regulation Summit
- Edie 23
- Gitex Impact in Dubai
- Anthropy
- SME Panel at Lab Party Conference
- Reset Connect
- SME Parliamentary Drop-In
- Net Zero Festival
- Normative webinar
- LinkedIn Live
- Fintech Talents
- Innovate Finance: FinTech as a Force for Good
- Economist Impact Interview
- Climate Innovation Forum
- Westminster Forum
- Reuters Impact ESG Investment Summit
- Mentioned positively in the House of Lords during an AI debate

3. Vision, mission, values

Vision

Perseus will help automate sustainability reporting for every small business in the UK to reduce emissions faster. Perseus will make it easy to share accurate, assurable data that sits behind emissions calculations.

Mission

To create the rules and processes that make automated reporting possible, making it easier to implement reporting standards, Perseus will:

- Be co-created by the banking sector, carbon accounting applications and small business working together on a pre-competitive basis - working side-by-side solving a shared problem.
- Improve the quality and durability of the data they need and use.
- Enable a host of other products and services, such as emissions calculators, databases and reporting software.

Values

Openness

We will:

- Share our views and plans and share knowledge as widely as possible.
- Solicit and listen to views from end users and stakeholders.
- Make our outputs available under an open licence (e.g. CC-BY, OGL).

Expertise

We will:

- Bring our expertise to the discussion as individuals.
- Use our expertise to synthesise the views of others in constructive and forward-thinking proposals.
- Use good judgement to respect privacy and confidentiality.

Collaboration

We will:

- Support each other in discussion, in decisions and in delivery.
- Constructively hold each other to account on our commitments.
- Ensure all voices are heard and considered carefully.

Guiding principles and practices

To be considered throughout:

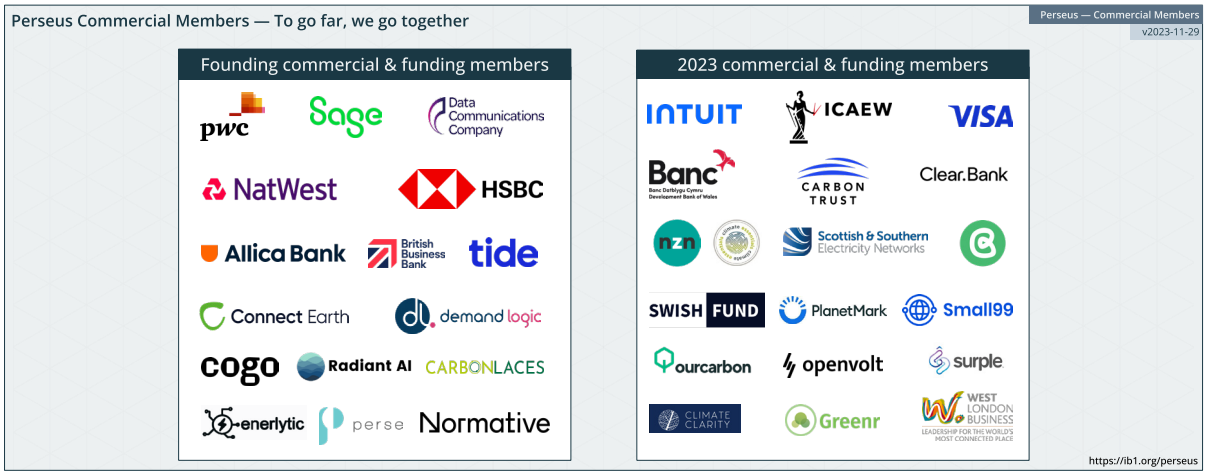
1. Users
    - Primary users (Banks, SMEs, software applications, energy data providers)
    - Related stakeholders (e.g. government, regulators, standards bodies, reporting bodies, asset managers)
2. Impact, reporting and decision-making needs
    - What is the priority for primary users for decision-making?
    - What is the priority for the reporting needs of Banks and SMEs?
3. Data supply needs
    - What is the priority to meet user and impact needs?

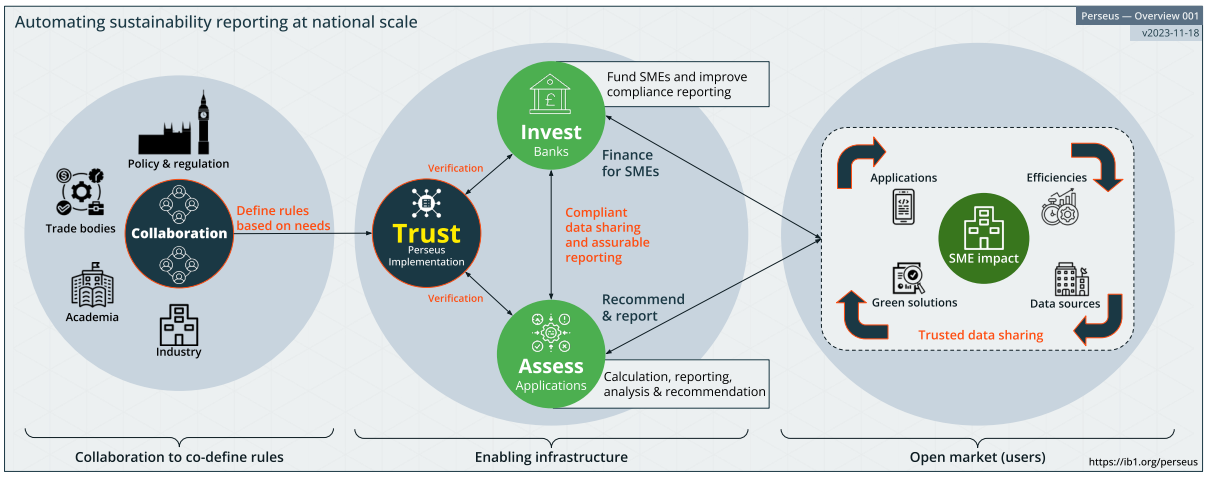
AG1 has defined the scope of Perseus to include focus on scientific, technical, legal, assurance, policy and communications processes. To create a cohesive and aligned approach across the market, a multistakeholder group has convened to discuss and align upon an **implementation** that is fit for purpose to enable the automation of GHG reporting in a meaningful and impactful manner.

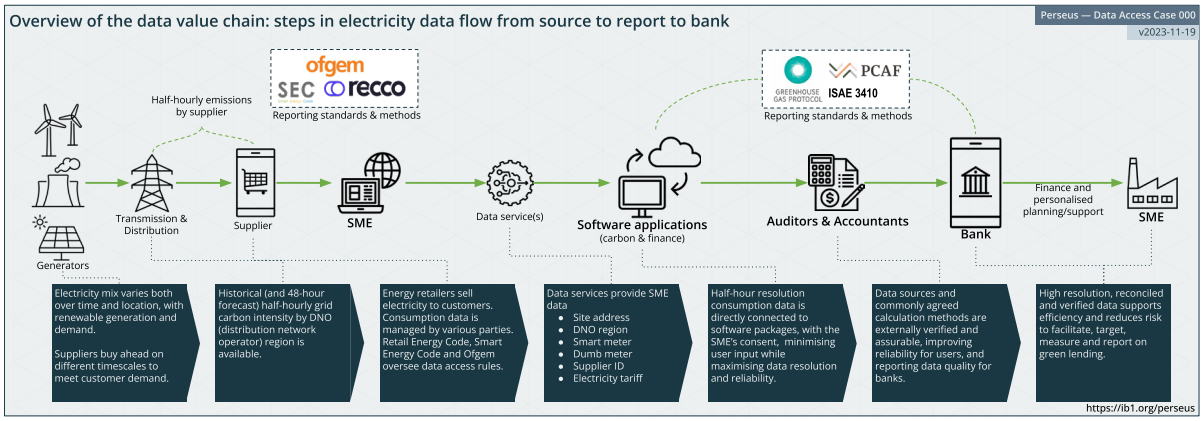
Members agreed that the 2023 scope was to align around a cohesive, comparable and interoperable implementation of footprinting electricity for Scope 2 reporting. This is to be aligned with the PCAF standard and GHG Protocol methodology.

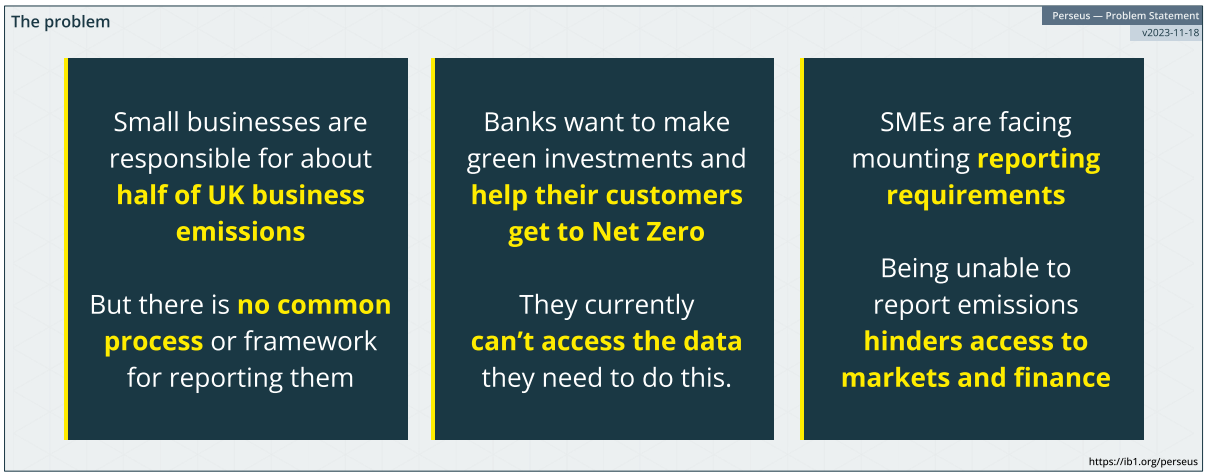
4. Visual guides and media assets

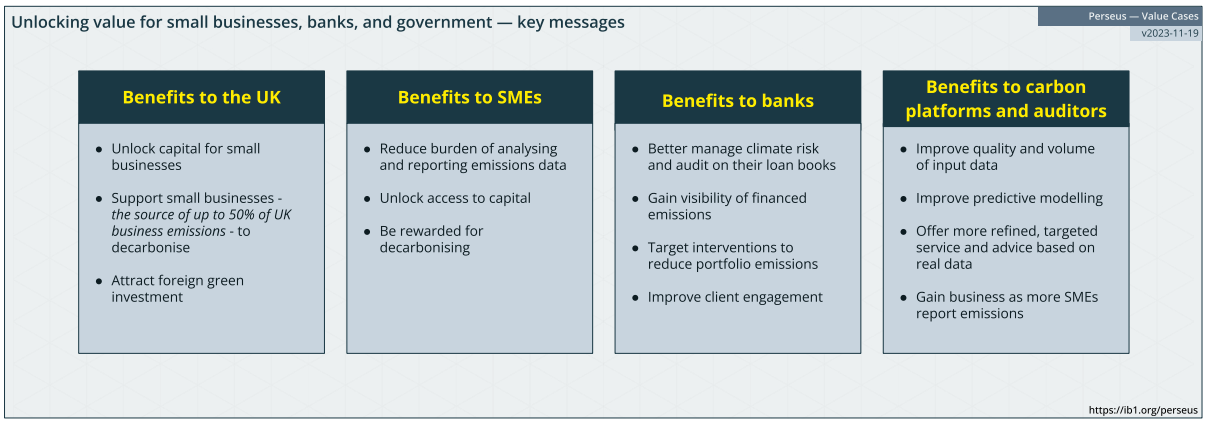
All public assets, images, documents and contract terms are online at https://ib1.org/perseus/assets






Overview of the data value chain: steps in electricity data flow from source to report to bank
Perseus — Data Access Case 000
v2023-11-19
ofgem
SEC
recco
Reporting standards & methods
PCAF
GREENHOUSE GAS PROTOCOL
ISAE 3410
Reporting standards & methods
Half-hourly emissions by supplier
Generators
Transmission & Distribution
Supplier
SME
Data service(s)
Software applications (carbon & finance)
Auditors & Accountants
Bank
Finance and personalised planning/support
SME
Electricity mix varies both over time and location, with renewable generation and demand.
Suppliers buy ahead on different timescales to meet customer demand.
Historical (and 48-hour forecast) half-hourly grid carbon intensity by DNO (distribution network operator) region is available.
Energy retailers sell electricity to customers. Consumption data is managed by various parties. Retail Energy Code, Smart Energy Code and Ofgem oversee data access rules.
Data services provide SME data
Site address
DNO region
Smart meter
Dumb meter
Supplier ID
Electricity tariff
Half-hour resolution consumption data is directly connected to software packages, with the SME's consent, minimising user input while maximising data resolution and reliability.
Data sources and commonly agreed calculation methods are externally verified and assurable, improving reliability for users, and reporting data quality for banks.
High resolution, reconciled and verified data supports efficiency and reduces risk to facilitate, target, measure and report on green lending.
https://ib1.org/perseus


The problem
Perseus — Problem Statement
v2023-11-18
Small businesses are responsible for about half of UK business emissions
But there is no common process or framework for reporting them
Banks want to make green investments and help their customers get to Net Zero
They currently can't access the data they need to do this.
SMEs are facing mounting reporting requirements
Being unable to report emissions hinders access to markets and finance
https://ib1.org/perseus


Unlocking value for small businesses, banks, and government — key messages
Perseus — Value Cases
v2023-11-19
Benefits to the UK
Unlock capital for small businesses
Support small businesses - the source of up to 50% of UK business emissions - to decarbonise
Attract foreign green investment
Benefits to SMEs
Reduce burden of analysing and reporting emissions data
Unlock access to capital
Be rewarded for decarbonising
Benefits to banks
Better manage climate risk and audit on their loan books
Gain visibility of financed emissions
Target interventions to reduce portfolio emissions
Improve client engagement
Benefits to carbon platforms and auditors
Improve quality and volume of input data
Improve predictive modelling
Offer more refined, targeted service and advice based on real data
Gain business as more SMEs report emissions
https://ib1.org/perseus

Perseus Implementation ('Scheme')

(Shared Data with explicit user permission, Assurable)

Reporting, Regulator(s)

Bank

Collaborative design of the rules

Policy / regulation

Collaboration

Trade bodies

Commercial members

Academia

Mandates

Co-designs

Operates

Trust Framework

Open standards

Publishes

Implements

Operates

Directory (Licences)

Directory (Organisations)

Directory (Assured Data)

Sandbox

Perseus Implementation of the rules ('Scheme')

Verification

Application (e.g. carbon reporting)

Service Provider (permission management)

Permission

SME

Primary data flow

Data source (e.g. smart meter)

Open metadata

OpenNetZero.org
Data discovery

Data flows with explicit permission from SME

Verification is applied across the market using a Trust Framework

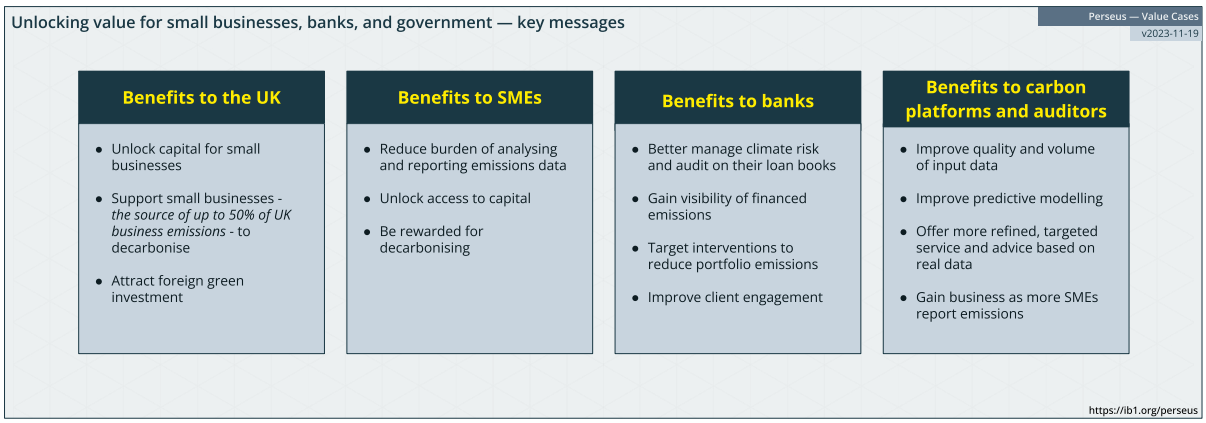
Icebreaking processes
(Steering, Advisory and Working Groups)

Icebreaking
Process to co-define rules through collaborative, multi-stakeholder engagement

Licences
Codified rules (legal, technical, rights, liability, communication, policies)

Verification and Assurance
Tests to what levels organisations and/or datasets are compliant

5. Business and value cases



Overview of value cases for different stakeholders

Each stakeholder has identified and communicated specific value cases for collaboration in this pre-competitive project.

For **lenders**, unlocking access to assurable data will materially influence the ability to deploy capital in the hundreds of billions of pounds.

For **government**, unlocking access to assurable data creates an opportunity for tax incentives to be created. Discussions are underway about the potential to create corporation tax benefits that could have a value in the hundreds of millions of pounds.

For those implementing **solutions**, material improvements in efficiency of processes are expected (removing manual data gathering, cleaning and preparation ready for analysis). This reduces costs, increases accuracy, improves assurability, increases speed-to-analysis and enables 'real time' recommendations and reporting. Estimates are for 5-10x improvements over existing processes for 'standard' data. And, the ability to access granular data enables the creation of personalised transition plans.

Value to banks

Since its launch at COP26 in Glasgow, the Partnership for Carbon Accounting Financials (PCAF) has grown to include 448 institutions, with $94.7 trillion in financial assets under management, including 28 headquartered in the UK, managing almost £10 trillion.

PCAF signatories have committed to drive funding towards decarbonisation initiatives and to improve the quality of the data they use to report progress towards this commitment. Bank participants in Perseus have stated that automating the communication of reliable, high-resolution energy consumption data from customers is critical to increasing green investment.

The reduction in clerical overheads and data risk unlocks investment capital, allowing banks to deliver preferential financial products for green purposes. NatWest alone has committed to providing £100 billion of climate and sustainable financing[6] by the end of 2025.

6 NatWest-pledges-£100bn-of-Climate-and-Sustainable-Funding-and-Financing(natwestgroup.com)

Value to businesses

UK business used around 84 billion kWh of electricity in 2020[7]. At an average small business tariff rate of 28p/kWh, this represents a cost of £23.5 billion. The average business can save between 18% and 25% of energy use[8] through the implementation of simple efficiency measures, representing a potential saving to UK industry of around £5 billion per year.

Facilitating access to high resolution energy consumption data unlocks a whole new business sector in AI-based energy demand analysis, in much the same way that open banking opened the door to developments in the UK fintech sector, which is now growing three times faster than the traditional banking sector.

This will have knock-on effects in reducing the cost of green technologies by scaling up manufacturing, sales and installation. The UK renewables and clean tech sector is already expected to double in size to £46 billion by 2035[9]; this would increase this rate of growth significantly.

Value to carbon reporting and accounting solutions

Many large UK businesses have commited to achieving net zero GHG emissions by some date before 2050. For most businesses, however, most of their emissions are in their supply chains. They can only reduce these emissions if their suppliers measure and report their carbon footprints.

Many of those suppliers are smaller businesses, lacking the skills and resources to measure carbon footprints. This problem has been addressed in recent years by the development of carbon accounting platforms, which use existing reliable data sources to automate the process of calculating a carbon footprint. Typically, they will use banking or accounting data, but the availability of reliable, high-resolution, automated energy consumption data facilitates a step-change in the capability of these platforms.

Data, commissioned by Sage, suggests that around 750,000 UK businesses are ready and willing to report sustainability metrics, but lack the skills and resources to do so. The established benefits of measuring and managing emissions (and their associated costs) across these businesses would result in estimated savings of around £9 billion.

Potential to support net zero retrofits

The UK's built environment requires a significant retrofit if the country is to meet its legally binding net zero obligations. Access to reliable information on the cost of current energy consumption and the ability to measure the impact of interventions, will help to identify efficiencies in this programme, for which access to capital from banks is key.

Value in addressing the climate emergency in the public sector

Like many large businesses, many local authorities and other institutions have declared a climate emergency, accompanied by a commitment to achieve net zero before 2050; in many cases well in advance of this. One barrier to achieving this is a lack of data, particularlyenergy consumption data for entire local authority regions. The ability to access and analyse this information will remove this barrier, allowing these institutions to visualise the large data sets relating to their commitments and to plan their implementation

7 Energy consumption in the UK 2021 - GOV.UK (gov.uk)
8 Barriers_to_Energy_Efficiency_FINAL_2014-12-10.pdf (publishing.service.gov.uk)
9 Report: Value of UK renewables and clean tech sector could double to £46bn by 2035 | BusinessGreen News

SMEs (SME)

The business case for SMEs to engage lies in the potential for accessing capital, reducing emissions and enhancing reputation. As end-beneficiaries, SMEs do not have to join Perseus directly. Instead they are users of the software applications and banking solutions that use the SME's data to provide insight. The SME does, however, have to provide explicit Permission for those organisations to use their data for analysis. Key points include:

1. **Access to capital:** we aim to help SMEs unlock access to capital to reduce their emissions. By providing automated access to assurable energy data, SMEs can demonstrate their commitment to sustainability and provide reliable data to lenders. This will help them secure financing for energy efficiency upgrades, renewable energy projects and other sustainability initiatives.
2. **Improved data quality:** we will improve the quality of data related to GHG emissions and energy usage. By automating the delivery of assurable data, SMEs will ensure that their data is accurate, reliable and standardised. This will help them identify areas for improvement, track progress and report on their sustainability performance more effectively.
3. **Enhanced reputation:** participation can enhance the reputation of SMEs who use solutions that are part of the Perseus Implementation. By demonstrating their commitment to sustainability and transparency, SMEs can differentiate themselves from competitors and attract customers who prioritise sustainability. This can lead to increased brand loyalty, customer retention and positive recognition.
4. **Cost savings:** a core benefit will help SMEs identify opportunities for cost savings related to energy usage. With access to comprehensive and reliable data, SMEs can identify areas for improvement, implement energy efficiency measures and reduce their energy costs. This can lead to significant cost savings over time, improving their financial health.
5. **Compliance:** automating emissions reporting will help SMEs comply with regulatory requirements related to GHG emissions and sustainability reporting. By automating the delivery of assurable data, SMEs can ensure that they meet regulatory requirements and avoid potential penalties or fines.
6. **Business growth opportunities:** as consumers and customers increasingly prioritise sustainability, SMEs that demonstrate their commitment to sustainability will attract new customers and expand their customer base. By participating in solutions that are members of the project, SMEs can differentiate themselves from competitors and tap into the growing market for sustainable products and services.

In summary, participating in solutions 'powered by' the project offers SMEs numerous benefits, including access to capital, improved data quality, enhanced reputation, cost savings, compliance and business growth opportunities. By engaging, SMEs can demonstrate their commitment to sustainability, improve their financial health and position themselves for long-term success.

Banks

Perseus is a global initiative that will enable banks and other financial institutions to unlock net zero incentives and reduce risks with open standards and assurable data.

The business case for banks to engage lies in the potential for improved climate risk management, enhanced ESG reporting and alignment with industry standards, such as PCAF and GHG Scope 3 Category 15. Key points include:

1. **Improved climate risk management:** the aim is to better manage climate risk and audit loan books. By engaging, banks will access reports based on reliable and standardised energy data that will improve their ability to assess and manage climate-related risks. This will help banks identify potential vulnerabilities, develop mitigation strategies and ensure the long-term sustainability of their operations and investments. Alignment will enhance the credibility and reliability of banks' climate

risk management practices, increasingly valued by investors and stakeholders. Further, improving the assessment of its customers will reduce the cost of capital and increase potential net zero lending.

2. **Enhanced ESG reporting and regulatory compliance:** Perseus is aligned with regulatory requirements related to climate risk management, emissions reporting and sustainability. It aims to afford banks the opportunity to improve their ESG reporting and disclosure practices. By participating, banks can access reports based on reliable and standardised energy data that will enhance the quality and accuracy of their ESG reporting. This will help banks meet regulatory and compliance requirements, respond to investor demands and demonstrate their commitment to sustainability. By aligning, banks can contribute to the development of industry standards and best practices in ESG reporting and disclosure.

3. **Addressing GHG Scope 3 Category 15 and alignment with PCAF:** the Partnership for Carbon Accounting Financials (PCAF), a global initiative that aims to develop a harmonised approach to measuring and disclosing the GHG emissions of financial institutions, has engaged in AG1 to ensure alignment. Perseus is aligned with PCAF's methodology and reporting framework, and will enhance the comparability and reliability of its emissions data. It can help banks improve their reporting from a score of four (4) or above (poor) to a two (2) and below (good). Fully automating implementation of the PCAF methodology within the Perseus implementation with assurable data would further push calculation to a score of one (1), assuming there are no weak links elsewhere in the calculation methodology. This alignment demonstrates commitment to industry standards and best practices in carbon accounting and disclosure. In automating the usage of energy data to support Scope 2 for SMEs, banks will improve their GHG Scope 3 Category 15 emissions reporting and identify options (including personalised recommendations) that can help reduce the emissions of SME customers. This will help banks meet regulatory requirements, derisk the deployment of capital, respond to investor demands and demonstrate their commitment to sustainability. By aligning, banks will contribute to the development of industry standards and best practices in PCAF emissions reporting and disclosure.

4. **Market opportunities:** engaging positions banks as industry leaders in sustainability and innovation. This will open up new market opportunities for them, including attracting environmentally conscious clients, accessing sustainable investment opportunities and differentiating themselves from competitors. By aligning and demonstrating a commitment to climate risk management, ESG reporting and industry standards, banks will enhance their reputation, build trust with stakeholders and strengthen their market position.

5. **Collaboration and partnerships:** engaging will also provide banks with the opportunity to collaborate with other financial institutions, technology providers and industry experts. This collaboration can foster knowledge sharing, innovation and the development of best practices in climate risk management and emissions reporting. By participating, banks can access valuable resources, expertise and networks to support their sustainability efforts and drive continuous improvement. Additionally, collaboration with other stakeholders can lead to the development of new financial products and services that align with the transition to a low-carbon economy.

In summary, engaging can bring numerous benefits to banks, including improved climate risk management, enhanced ESG reporting, alignment with industry standards, market opportunities, collaboration and partnerships and regulatory compliance. By aligning, banks can strengthen their sustainability practices, enhance their reputations, attract environmentally conscious clients, access sustainable investment opportunities and contribute to the transition to a low-carbon economy.

Energy companies

The business case for an energy company to engage is based on the benefits it can bring to the company's operations, reputation and alignment with sustainability goals. Key points include:

1. **Capital allocation planning:** Distribution Network Operators (DNOs) and related parts of our energy infrastructure need to know where the demands of their customers will intersect with funding, so they can use their capital allocation plans[10] to greatest impact.
2. **Streamlined data access:** we aim to automate access to assurable energy data at market scale. By engaging, an energy company can benefit from streamlined access to reliable and standardised energy data. This can improve the company's internal data management processes, enhance operational efficiency and facilitate data-driven decision-making.
3. **Enhanced sustainability reporting:** we are focused on automating GHG reporting across the entire economy. By engaging, an energy company can improve its sustainability reporting capabilities. This can help it meet regulatory requirements, demonstrate its commitment to transparency and accountability and enhance its reputation as a responsible and sustainable energy provider.
4. **Market opportunities:** as a bold initiative, energy companies can position as industry leaders in sustainability and innovation. This can open up new market opportunities, attract environmentally conscious customers and differentiate the company from competitors. By aligning, energy companies can demonstrate their commitment to addressing climate change and contribute to the transition to a low-carbon economy.
5. **Risk management:** we aim to better manage climate risk and audit loan books. By engaging, an energy company can improve its ability to assess and manage climate-related risks. This can help it identify potential vulnerabilities, develop mitigation strategies and ensure the long-term sustainability of its operations and investments.
6. **Collaboration and partnerships:** engaging provides an opportunity for an energy company to collaborate with other stakeholders, including financial institutions, technology providers and auditors. This collaboration can foster knowledge sharing, innovation and the development of new low-carbon technologies and solutions. It can also enhance the company's reputation as a collaborative and forward-thinking industry player.

In summary, engaging can bring benefits to an energy company in terms of streamlined data access, enhanced sustainability reporting, market opportunities, risk management and collaboration. By aligning, an energy company can improve its operational efficiency, strengthen its reputation, seize market opportunities, manage climate-related risks and contribute to the transition to a sustainable energy future.

Audit firms

The business case for an audit firm to engage lies in the potential for enhanced audit quality, risk management and reputation. Key points include:

1. **Improved audit quality:** we aim to automate access to assurable energy data at market scale. By engaging, an audit firm can benefit from streamlined access to reliable and standardised energy data. This can improve the quality and accuracy of audit procedures, enabling more effective identification and assessment of climate-related risks and opportunities. This can also enhance the credibility and reliability of audit reports, aligning with the objectives of audit firms to provide high-quality and reliable assurance services.

10 https://ib1.org/2023/11/14/ib1-partners-with-ssen-t-to-shaping-the-future-of-grid-connection-requests/

2. **Enhanced risk management:** we seek to better manage climate risk and audit loan books. By engaging, an audit firm can improve its ability to assess and manage climate-related risks. This can help it identify potential vulnerabilities, develop mitigation strategies and ensure the long-term sustainability of its operations and investments. It can also enhance the firm's reputation as a responsible and forward-thinking industry player.

3. **Market opportunities:** engaging can position an audit firm as an industry leader in sustainability and innovation. This can open up new market opportunities, attract environmentally conscious clients and differentiate the firm from competitors. By aligning, audit firms can demonstrate commitment to addressing climate change and contribute to the transition to a low-carbon economy.

4. **Collaboration and partnerships:** engaging provides an opportunity for an audit firm to collaborate with other stakeholders, including financial institutions, technology providers and ESG standards bodies. This can foster knowledge sharing, innovation and the development of new audit methodologies and tools. It can also enhance the firm's reputation as a collaborative and forward-thinking industry player.

5. **Regulatory compliance:** we align with regulatory requirements related to climate risk management and reporting. By engaging, audit firms can ensure compliance with these requirements and provide added value to clients. This can also enhance the firm's reputation as a trusted and reliable provider of audit services.

In summary,engaging can bring benefits to an audit firm in terms of improved audit quality, enhanced risk management, market opportunities, collaboration and regulatory compliance. By aligning, an audit firm can improve its operational efficiency, strengthen its reputation, seize market opportunities, manage climate-related risks and contribute to the transition to a sustainable future.

Carbon accounting, reporting and analysis firms

The business case for carbon accounting and analysis firms to engage lies in the potential for improved data quality, granularity and assurance, enhanced reporting capabilities and alignment with industry standards, such as PCAF and GHG Scope 3 Category 15. In addition, this approach represents a step-change in customer experience by making the connection to data a one-click process. With strong supporting communications, the process should increase trust and engagement with the SME community. Key points include:

1. **Improved data quality:** we will automate access to assurable energy data, which can improve the quality and reliability of emissions data. By engaging, carbon accounting firms can access standardised and reliable energy data that can enhance the accuracy and completeness of their emissions inventories. This helps firms provide more robust and reliable carbon accounting services to their clients, enhancing their credibility and reputation in the market.

2. **Enhanced reporting capabilities:** carbon accounting firms have the opportunity to enhance their reporting capabilities and provide more comprehensive and accurate emissions reports to their clients. By participating, carbon accounting firms can access reliable and standardised energy data that can improve the quality and accuracy of their emissions reports. This can also help them meet regulatory requirements, respond to investor demands and demonstrate their commitment to sustainability. Additionally, by aligning, carbon accounting firms can contribute to the development of industry standards and best practices in emissions reporting and disclosure.

3. **Alignment with PCAF:** The PCAF has engaged in AG1 to ensure alignment. By engaging, carbon accounting firms can align with PCAF's methodology and reporting framework, enhancing the comparability and reliability of their emissions data. This alignment can also demonstrate a firm's commitment to industry standards and best practices in carbon accounting and disclosure.

4. **Address GHG Scope 3 Category 15:** So that GHG Scope 3 Category 15 emissions for banks can be improved, we are focused on automating access to assurable energy data to automate Scope 2 reporting for SMEs. By engaging, carbon accounting firms can gain insights into their customer's Scope 2 emissions and identify opportunities to reduce their carbon footprints. This can help them provide more comprehensive and accurate emissions reports to their clients, enhancing their credibility and reputation in the market. Additionally, by aligning, carbon accounting firms can contribute to the development of industry standards and best practices in Scope 3 emissions reporting and disclosure.

5. **Market opportunities:** engaging can position carbon accounting firms as industry leaders in sustainability and innovation. This can open up new market opportunities for carbon accounting firms, including attracting clients who prioritise accurate and comprehensive carbon accounting, accessing partnerships with financial institutions and technology providers and differentiating themselves from competitors. By aligning and demonstrating a commitment to data quality, enhanced reporting capabilities and industry standards, such as PCAF, firms can enhance their reputation, build trust with clients and strengthen their position in the market.

6. **Collaboration and partnerships:** engaging provides carbon accounting firms with the opportunity to collaborate with other stakeholders, including financial institutions, energy companies and technology providers. This can foster knowledge sharing, innovation and the development of best practices in carbon accounting and emissions reporting. By participating, firms can access valuable resources, expertise and networks that can support their sustainability efforts and drive continuous improvement. Additionally, collaboration with other stakeholders can lead to the development of new services and solutions that align with the transition to a low-carbon economy.

7. **Regulatory compliance:** we align with regulatory requirements related to emissions reporting, sustainability and transparency. By engaging, carbon accounting firms can ensure compliance with these requirements and avoid potential penalties or reputational risks. This alignment can also provide firms with a structured framework for reporting and managing emissions, simplifying the process and reducing administrative burdens. By proactively addressing regulatory expectations through participation, they can demonstrate their commitment to responsible and accurate carbon accounting practices.

In summary, engaging will bring numerous benefits to carbon accounting firms, including improved data quality, enhanced reporting capabilities, alignment with industry standards – such as PCAF – and methodologies – such as the GHG Protocol – market opportunities, collaboration and partnerships and regulatory compliance. By aligning, carbon accounting firms can strengthen their sustainability practices, enhance their reputation, attract clients who prioritise accurate carbon accounting, access partnerships and collaborations and contribute to the transition to a low-carbon economy.

Standards and reporting bodies

The business case for ESG standards, framework and reporting bodies – such as PCAF, the World Benchmarking Alliance (WBA) and the Carbon Disclosure Project (CDP) – to support the project lies in the potential for collaboration, alignment of objectives and the advancement of sustainable finance. Key points include:

1. **Harmonisation of reporting standards:** organisations, such as PCAF and the CDP, are dedicated to developing and promoting standardised reporting for carbon accounting and disclosure. By engaging, these bodies can contribute to the harmonisation of reporting standards and methodologies. This alignment can enhance data comparability, reliability and transparency, enabling more accurate and meaningful assessments of carbon emissions and climate-related risks.

2. **Facilitating carbon accounting:** large enterprise businesses have the resources to calculate and report their carbon footprints in compliance with established standards. However, over 99% of businesses are SMEs and are responsible for around half of all business emissions (around a quarter of total

emissions[11]). By automating the process of measuring and reporting emissions, we will reduce the need for the expertise and time that small businesses lack. In turn, this opens up the potential for accurate, reliable reporting across supply chains comprising businesses of all sizes, which is essential for managing emissions to achieve net zero.

3. Data quality and assurance: we will provide a trusted and assurable process for accessing and reporting GHG data. ESG standards and reporting bodies can contribute to the development of robust data quality and assurance mechanisms. This can enhance the credibility and reliability of GHG data reported by financial institutions, aligning with the objectives of PCAF, WBA and CDP to ensure accurate and verifiable carbon accounting.

4. Integration of financial and ESG data: we will automate the flow of energy data from utilities to financial institutions. ESG standards bodies can contribute to the integration of financial and ESG data. This integration can provide a more comprehensive view of the environmental impact and climate risks associated with financial portfolios. It can also facilitate the development of innovative financial products and services that incorporate ESG considerations.

5. Advancement of sustainable finance: we align with the objectives of sustainable finance, which aims to integrate environmental and social factors into investment decision-making. ESG standards bodies can contribute to the advancement of sustainable finance practices. This can help investors and financial institutions better assess climate-related risks, allocate capital to low-carbon and sustainable projects and drive positive environmental and social outcomes.

6. Collaboration and knowledge sharing: this is an opportunity for ESG standards bodies to collaborate with other stakeholders, including financial institutions, utilities and technology providers. This can foster knowledge sharing, innovation and the development of best practices in carbon accounting and disclosure. It can also enhance the collective understanding of emerging sustainability challenges and facilitate the evolution of reporting frameworks to address these challenges.

In summary, engaging can bring benefits to standards and reporting bodies in terms of harmonisation of reporting standards, data quality and assurance, integration of financial and ESG data, advancement of sustainable finance and collaboration. By endorsing and collaborating, standards, frameworks and reporting, bodies, such as PCAF, WBA and CDP, can contribute to the development of standardised and reliable carbon accounting practices, enhance the credibility of GHG data, promote the integration of financial and ESG considerations and drive positive environmental and social outcomes. This can also foster knowledge sharing, innovation and the development of best practices in carbon accounting and disclosure, ultimately advancing the collective understanding and implementation of sustainable finance principles.

Regulators and policymakers

The value case for government policymakers and regulators to engage lies in the potential for improved climate risk management, enhanced emissions reporting and alignment with regulatory requirements and industry standards. Key points include:

1. **Improved climate risk management:** we will automate access to assurable energy data, which can improve the quality and reliability of emissions data. By engaging, policymakers and regulators can access standardised and reliable energy data that can enhance their understanding of climate risks and inform policy decisions. This can help policymakers and regulators develop more effective climate policies, identify areas of high risk and support the transition to a low-carbon economy.

2. **Enhanced emissions reporting:** policymakers and regulators have the opportunity to enhance emissions reporting capabilities and provide more comprehensive and accurate emissions reports

11 https://ourworldindata.org/ghg-emissions-by-sector

to industry and the public. By participating, policymakers and regulators can shape the definitions of reliable and standardised data that can improve the quality and accuracy of emissions reports. This can help them create regulatory requirements, respond to public demands for transparency and demonstrate their commitment to sustainability. Additionally, by aligning, they can contribute to the development of industry standards and best practices in emissions reporting and disclosure.

3. **Shape regulatory requirements:** we help implement regulatory requirements related to climate risk management, emissions reporting and sustainability. By engaging, policymakers and regulators can ensure compliance requirements and incentives are aligned. This can also provide them with a structured framework for shaping reporting, simplifying the process and reducing administrative burdens, while also ensuring potential negative consequences are understood and mitigated. By proactively addressing regulatory expectations through participation, policymakers and regulators can demonstrate their commitment to responsible and sustainable policy-making.

4. **Alignment with industry standards:** the PCAF has engaged in AG1 to ensure alignment. By engaging, policymakers and regulators can better understand alignment with, and direct incentives towards, PCAF's methodology and reporting frameworks to enhance the comparability and reliability of emissions data.

5. **Market opportunities:** engaging can position policymakers and regulators as leaders in sustainability and innovation. This can help shape how opening up access to data in an open market will create new opportunities, including attracting investment, fostering economic growth and attracting businesses that prioritise sustainability. By aligning and demonstrating a commitment to data quality, enhanced reporting capabilities and industry standards, policymakers and regulators can enhance their reputations, build trust with stakeholders and strengthen their positions as leaders in climate action.

6. **Collaboration and knowledge sharing:** engaging provides policymakers and regulators with the opportunity to collaborate with other stakeholders, including financial institutions, energy companies and technology providers. This collaboration can foster knowledge sharing, innovation and the development of best practices in climate risk management and emissions reporting. By participating, policymakers and regulators can access valuable resources, expertise and networks that can support their policy-making efforts and drive continuous improvement. Additionally, collaboration with other stakeholders can lead to the development of new policies and regulations that align with the transition to a low-carbon economy (e.g. with the Net Zero Council).

7. **Public trust and transparency:** transparency and accountability in emissions reporting and climate risk management is core to the project. By engaging, policymakers and regulators can demonstrate their commitment to transparency and provide guidance for transparent, assurable, reliable and standardised information on emissions and climate risks. This can enhance industry and public trust in government actions, increase awareness and understanding of climate issues and foster public support for sustainable policies and regulations.

8. **International leadership:** by leading the way, policymakers and regulators can position themselves as international leaders in climate action. This can enhance their influence in global climate negotiations, attract international collaboration and partnerships and contribute to the development of global standards and best practices. By aligning policies and regulations, they can demonstrate their commitment to global climate goals and inspire other countries to follow suit.

In summary, engaging can enable government policymakers and regulators to bring benefits across the economy, including enabling improved climate risk management, enhanced emissions reporting, alignment with regulatory requirements and industry standards, market opportunities, collaboration and knowledge sharing, public trust and transparency and international leadership. By aligning, they can strengthen their climate policies, enhance their reputations, attract investment and businesses, foster economic growth and contribute to the global transition to a low-carbon economy.

The need for a green incentive for SMEs — a view from the IoD

SMEs generate around half of greenhouse gas emissions from businesses and so will need to play a significant role if the UK is to meet its 2050 net zero target. However, government policy has so far focussed on the large carbon emitters and, as a result, Institute of Director (IoD) data shows[12] less than three in ten SMEs (28%) currently have a plan to achieve net zero, insufficient to achieve our national goal. Supply chain pressures also appear weak: around three-quarters of IoD members have never been asked by a current or future customer or client to demonstrate their carbon footprint.

A survey conducted in August 2023 found that across the SME population as a whole around 15% agree with the statement "we have increased overall investment spending mainly in order to implement the organisation's policy on climate change" rising to around one in five companies employing between 50-249 people, and one in three for larger companies. Getting the incentives right for small companies to reduce their carbon footprint therefore also increases aggregate levels of investment, supporting the wider macroeconomy.

IoD members cited the 'lack of a clear business case to invest in net zero measures' as one of the biggest obstacles in reducing their carbon footprint. Two-thirds says financial support or incentives from Government would be most useful in helping them to address climate change. Its research shows that the most effective way to spur change would be to have a lower corporation tax for organisations that have achieved net zero compared to those that have not: around two-thirds of SMEs who currently have no plan to achieve net zero say they would either be 'much more likely' (32%) or 'a bit more likely' (32%) to do so if it resulted in a lower corporation tax bill.

Depending on how the tax differential is calculated, this outcome could be achieved at nil cost to the Exchequer. The important outcome is that there is a wedge between the two to act as a clear business case for change; the differential could be adjusted over time to calibrate the response and in the light of prevailing fiscal circumstances. This proposal, including implications for the company accounting, is available in The Green Incentive (2022).

Getting the incentive right for decarbonisation will not only help Britain achieve its carbon targets but it will also lead to higher levels of investment across the board, spurring productivity improvements and overall economic growth.

The following additional measures are also required to support SMEs during the transition to net zero:

- Guidance to businesses around the type of monitoring of greenhouse gas emissions that will be expected in future. This would minimise the compliance costs of starting to measure in one way then having to alter the methodology later.
- Implementation of the Skidmore recommendation[13] to launch a 'Help to Green' campaign, offering information resources and vouchers for SMEs to plan and invest in the transition.
- A requirement on landlords to provide organisations with information about the carbon footprint of the premises they lease, to ensure that businesses can access the data they need to calculate their carbon impact.
- Prioritise the development of the UK's Green Taxonomy to channel capital into viable, sustainable investments.

Perseus' implementation of alignment and automation will simplify monitoring, compliance and consistency, and could support this proposal.

12 Citation pending

13 https://gov.uk/government/news/net-zero-review-uk-could-do-more-to-reap-economic-benefits-of-green-growth

6. Outcomes, prioritisation and rationale

Process to define outcomes, outputs and enable rapid progress

Each Advisory Group must:

1. Clearly define its scope, including the specific **outcomes** it aims to accomplish. Depending on the group, these could be increasing awareness, defining policy direction, tackling technical challenges or resolving data rights and legal issues.
2. Define specific **outputs**, these may include documented use cases that illustrate user needs, case studies, a defined audience, key messaging, engagement plan, policy recommendations, technical solutions or legal reports. Outputs must include, at a minimum, a summary of the needs of the users, user/stakeholder categorisation and ecosystem map, user/stakeholder input/questionnaire on their needs, value statement(s) and a synthesis report with the recommended approach that can be endorsed by the Group.

For each recommendation in each Advisory Group, we must ensure it delivers the Scope, aligned with the following challenge question used at review and endorsement milestones: Has this Advisory Group addressed the Scope?

1. If not, why not?
2. If so, why and at what scale?
3. What are the blockers, incentives and opportunities?

When blockers are identified, the strong direction is that all Advisory Groups revise, reduce and/or contain scope to enable outcomes to be delivered.

Why this, why now?

Investing now in a collective-action challenge for climate change is about taking responsibility, demonstrating leadership and working together to safeguard the planet's future. Delaying action may jeopardise our ability to address climate change effectively and could result in missed opportunities for positive change. By acting now, we can contribute to a more sustainable, resilient and equitable future for all.

Drivers for engaging in Perseus include:

1. The urgency of climate change

Climate change is a pressing global challenge that requires immediate action. Waiting for others to address the issue may lead to irreversible environmental and social consequences. Investing now in collective action can help tackle climate change's root causes and effectively mitigate its impacts.

2. The multiplier effect

When multiple stakeholders come together to invest in collective action, the impact is magnified. Collective efforts can lead to more significant results, as resources, expertise and knowledge are pooled. Waiting for others to act might delay or weaken the effectiveness of the response.

3. Leadership and influence

By taking the initiative to invest in climate change challenges, we can demonstrate leadership and influence others to follow suit. Our actions can inspire and encourage others to contribute to the cause, creating a positive domino effect.

4. Innovation and learning

Early involvement in collective action allows for experimentation, learning and innovative solutions. Waiting for others to act might limit opportunities for developing new approaches and technologies that could lead to more efficient and impactful outcomes.

5. Risk mitigation

Climate change poses significant risks to businesses, communities and economies. Investing in collective action now can help mitigate those risks and ensure a more resilient future.

6. Moral and ethical responsibility

Addressing climate change is a moral and ethical responsibility to protect the planet and future generations. Delaying action may exacerbate inequalities and disproportionately harm vulnerable communities.

7. Policy and regulatory environment

Global efforts to combat climate change are likely to result in stricter policies and regulations in the future. Investing early can position organisations and individuals to comply with emerging standards and avoid potential penalties.

8. Economic opportunities

Investing in climate change solutions can create new economic opportunities, drive innovation and promote sustainable business practices. It can lead to the development of green technologies and industries, contributing to long-term economic growth.

9. Global collaboration

Climate change is a collective challenge requiring collaboration among governments, businesses, civil society and individuals. Investing now in collective action demonstrates a commitment to global cooperation and partnership.

10. Time for impact

Climate change requires long-term solutions. The longer we wait, the more challenging and costly it becomes to address its effects. Acting now increases the likelihood of achieving meaningful and lasting impact.

7. AG1: User needs and impact

AG1 is co-chaired by IB1 and Sage with over 50 members.

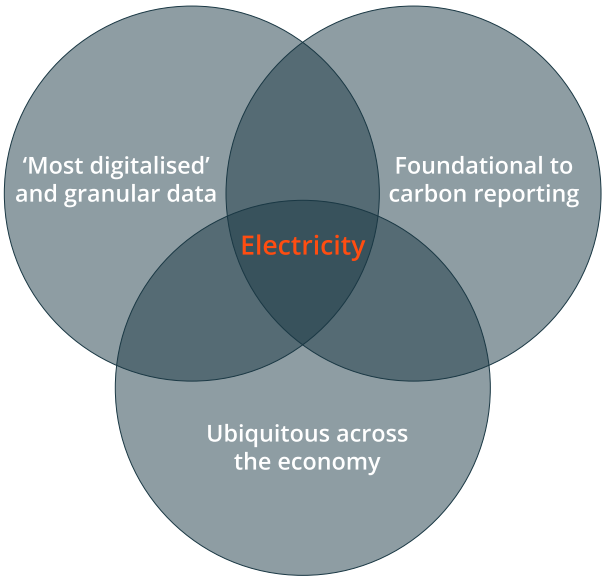
Priority use case for 2023 phase

Members have agreed the priority scope for implementation, aligned with the challenge to 'do one thing well' and an active principle of 'containment' to limit scope to the greatest usefulness, scale and achievability.

Members discussed, reviewed and prioritised based on the business and value cases. This explored decision-making priorities, led by the carbon reporting solutions and the banks and supported by domain experts, to highlight the challenges and opportunities relating to reporting flows, data flows and financial flows.

Priority was given to the definition of a cohesive implementation of the GHG Methodology, aligned with the PCAF Standard, in a manner that would ultimately lead to assurable data and support better analysis, recommendations, lower risk and address access (including automated access) to capital. Improved reporting on financed emissions is a consequential outcome of this approach. Central to its development is how any solutions can be scaled to the whole market with low friction.

Electricity was chosen as it is the 'most digitalised' of the utilities, ubiquitous and foundational for carbon reporting and relevant to the entire SME community. It also serves to illustrate the complexity and the achievability of enabling national-scale data sharing across sectors. By building the 'rails' for one area, others can follow.



Three specific electricity data access pathways have been prioritised:

1. For SMEs with their own smart meters: data via the national smart meter programme provider (SmartDCC, Digital Communications Company), which manages over 600,000 SME meters across the UK, either by direct access (Case 001); or,
2. via third-party aggregators (Case 002).
3. For SMEs in sublet offices: data from commercial solutions that utilise building management systems or equivalent digital, web-addressable technologies (Case 003).

Definitions

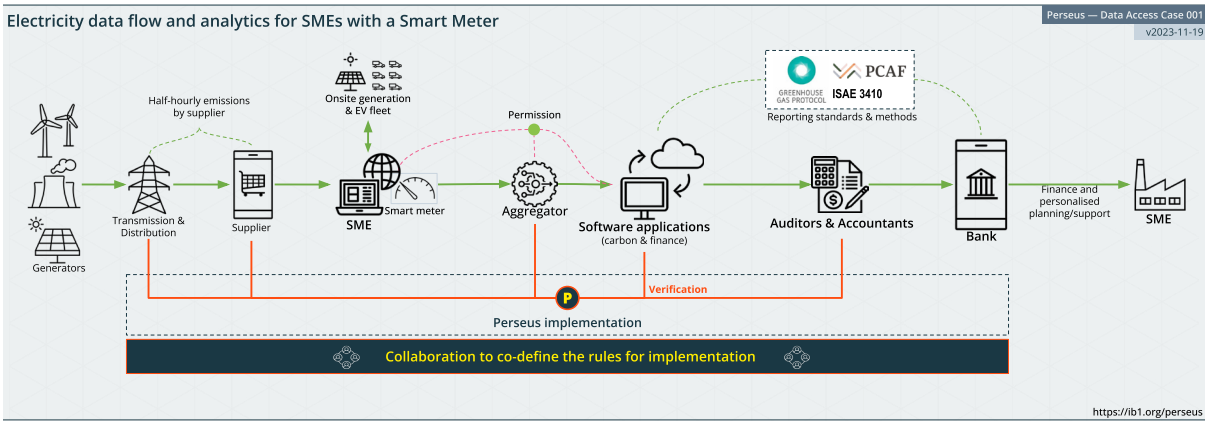
Purpose of usage	Carbon reporting to banks, including intermediate data processing, verification and assurance, as well as personalised recommendations and advice.
Generators	Sources of electricity.
Transmission and distribution	The large scale movement of electricity at high voltage levels from a power plant to a substation.
Supplier	An electricity retailer that sells energy to customers.
Smart meter	An electronic device that records information — such as consumption of electric energy, voltage levels, current and power factor — and communicates this information to the consumer and energy system's stakeholders.
Asset manager	An entity that controls shared assets (e.g. sublet offices) that are used by SMEs and are part of the data energy value chain related to the SME delivery of reporting to banks.
Aggregator	An organisation that combines data from multiple sources and makes it available to others. It may also assist in value-added services, such as data cleaning and harmonisation.
Software application	Including, but not limited to accountancy software, carbon reporting software, analytics solutions that combine data for the purposes of analysis and reporting (Purpose of Usage).
Accountant	A user of the reporting software that generates reports.
Auditor	An independent entity responsible for verification, audit and/or assurance.
Bank	Business banking and directly related financial platforms that provide banking services to SMEs. NB: the initial scope is tightly contained so that implementation does not try and address all actors (e.g. insurance, related financial services).
SME	The user of the energy and to which carbon reporting applies. The UK Government definition of SME is used.
MPAN	Meter Point Administration Number. A unique 13-digit reference that identifies each electricity supply point in the UK.
Global warming potential (GWP)	A measure of how much infrared thermal radiation a greenhouse gas added to the atmosphere would absorb over a given time frame[14].
CO_2e	Carbon Dioxide Equivalent. For any gas, the mass of CO2 that would warm the Earth as much as the mass of that gas.
Carbon intensity	The CO_2e emitted per unit of a product or process. For Perseus, the product is energy consumed by an SME.
PCAF Standard	Partnership for Carbon Accounting Financials Standards. A global GHG accounting and reporting standard for the financial industry.
GHG Methodology	A methodology to calculate the greenhouse gases emitted to provide products and services.

14 https://en.wikipedia.org/wiki/Global_warming_potential

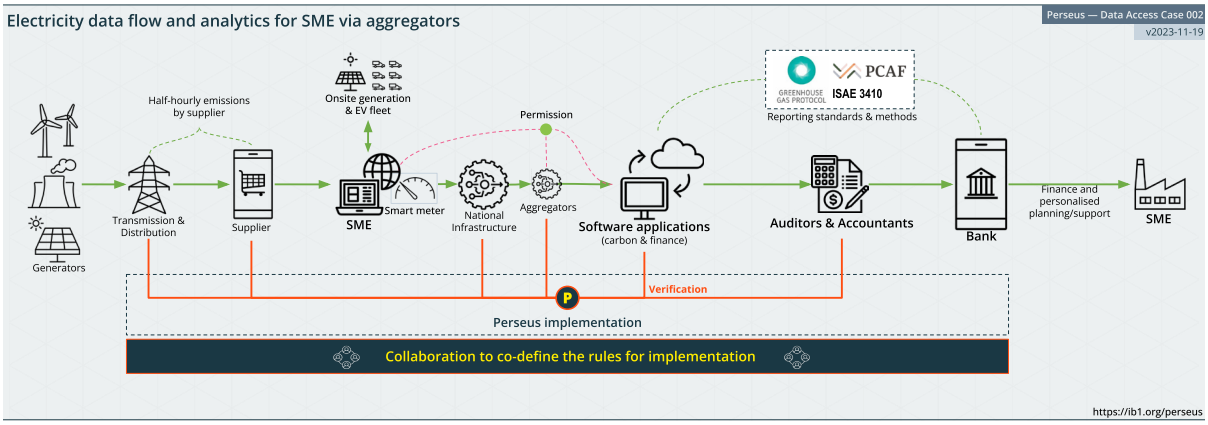
Summary of user needs

Three Data Access Cases (DACs) have been modelled in this phase:

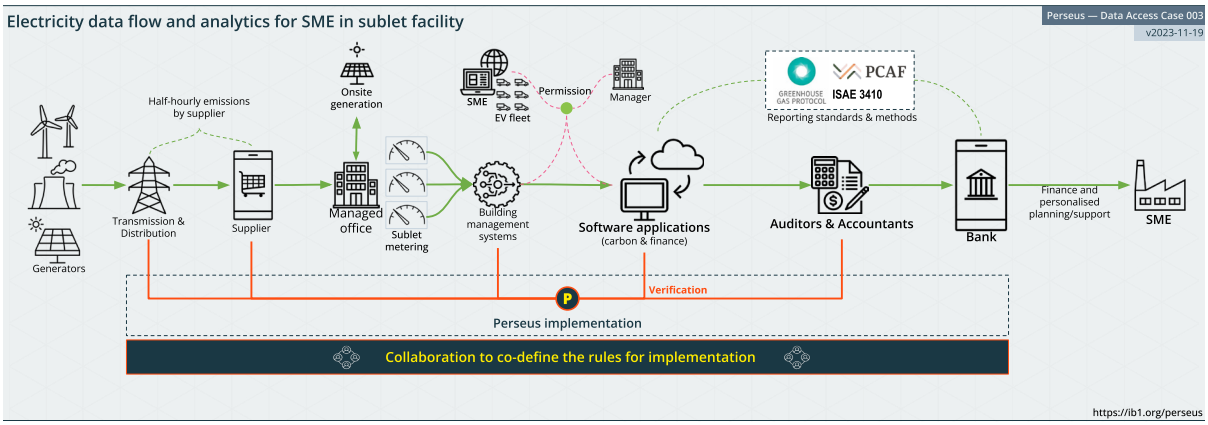
DAC-001: Shortest-path access to national smart meter programme (SmartDCC)



DAC-002: Access to national smart meter programme via additional intermediary aggregators that are separately integrated with SmartDCC (e.g. Perse).



DAC-003: Access to submetered data in managed facilities (e.g. sublet offices) via building management solutions, commercial data services and intermediary aggregators (e.g. Demand Logic).



Implementation of common standards and methodology

There are many high-level standards, frameworks and methodologies that can be applied in carbon reporting. Variance in their implementations, however, leads to poor quality outcomes in terms of trust, comparability and benchmarking.

AG1 members have endorsed a common implementation for Scope 2 reporting for electricity consumption in the UK. This embodies PCAF and the GHGP and defines a baseline approach as follows. Note that considerations are made and are included. Endorsed recommendations are in **bold**.

The Perseus Implementation **must**:

- For a specific, variable time period selected by the user and for a defined Meter Point Administration Number (MPAN), return:
  - **Half-hourly** (HH) **demand/consumption data** from smart meters. (e.g. data from SmartDCC and/or other commercial solutions).
  - **Tariff** information. Data from a trusted source.
  - **HH grid carbon intensity data**, for the relevant DNO. Data from National Grid ESO[15].
- For non-DCC metered information (e.g. from commercial third parties, which enable disaggregated submetering from managed offices)
  - **HH consumption data** via an assurable third-party service.
  - **HH grid intensity**, as above.
  - Link(s) to legal identifiers that represent the end customer (e.g. SME sublet of a managed office).
- In all cases, the provision of data must be able to be made on a **bulk-request** call by a data user from a data supplier, on a weekly, monthly, quarterly or annual basis. Such bulk requests must contain all data at HH resolution in a **technically efficient** manner (AG2).
- Such requests must be covered by **legal** terms that enable the usage of the data for the purpose(s) defined herein and restrict usage of the data for any other purpose (AG3).
- The **purpose** of such usage, including **rights** and **restrictions**, must be made clear and transparent to all users in the value chain (AG4).
- Where applicable, **policies** and **regulatory** changes must be made to enable the usage of the data for the **purpose**(s) herein at a national scale and aligned with the national data strategy (AG5).

It **should** also return:

- MPAN from company name and address data from SmartDCC or RECCo.
- Supplier ID from MPAN and data from SmartDCC.
- Dumb meter data from MPAN and data from SmartDCC.

15 Carbon Intensity API (carbon-intensity.github.io)

Research findings and outcomes

AG1 has demonstrated that while the landscape is complex and fragmented, it is possible to convene dozens of organizations around a common set of needs.

We have:

1. Understood and mapped the diverse links between the real and financial economies, standards, frameworks and methodologies and how they can be applied in a common implementation.
2. Explored options and determined an approach that can be applied to GHG Scope 3 Category 15 using PCAF and the GHG-Protocol. These have included emissions, location-based and market-based calculation methodologies.
3. Mapped the data value chain and its host organisations that address the use case.
4. Explored detailed implementation issues regarding the background and founding parameters of how to radically and rapidly improve Scope 2 reporting for SMEs across the UK.
5. Agreed a scope of work for 2023 that has been used by the other AGs.
6. Created a roadmap for 2024.
7. Highlighted the value and business cases for all stakeholders, including addressing financial and impact risks and efficiencies.

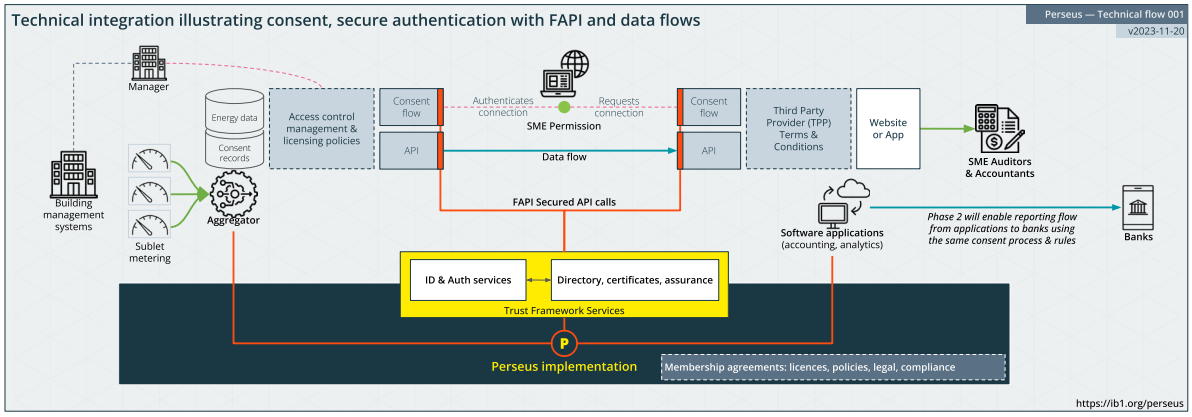
More detail on each of these points is provided in the Appendix.

The scope of work and recommendations for focus in 2024 is detailed in Chapter 11.

8. AG2: Technical architecture requirements, standards and systems

AG2 is co-chaired by IB1 and Normative, with over 20 members.

Overview of the data value chain



Members have agreed the architecture and technical implementation, aligned with the scope defined by AG1. Members discussed the details of energy and tariff data, permission and consent mechanisms and the adoption of financial-grade API standards (from Open Banking).

AG2 addresses:

- How energy and tariff data can be represented in standard-compliant ways, such as for consistent units and timestamps.
- Metadata required to enable data quality and provenance judgements to be made for assurance purposes later in the data value chain.
- Where permission for sharing consumption data should be captured, stored and used and the need to ensure that withdrawal of permission is supported.
- The scope of personal data in an SME/sole trader context and how to handle it in a regulation-compliant way.
- The reasoning behind the use of financial-grade API standards for assuring interactions between trust framework members.
- Barriers to scale and implementation of the technical approach.

Specific tasks being addressed include:

- Existing data formats and ontologies for energy data.
- Trust Framework entities and their attributes.
- Financial-grade API (FAPI) mechanisms to support secure data sharing.

Of note is that the Trust Framework approach is aligned with parallel work now formally announced by Ofgem and with the UK Smart Data Council.

Definitions

Data	A collection of discrete or continuous values that convey information describing the quantity, quality, facts, statistics and other basic units of meaning, or simply sequences of symbols that may be further interpreted formally. Wikipedia
Dataset	A collection of data.
Metadata	Data that provides information about other data.
Machine-readable data	Data in a format that a computer or sensor can readily parse and use.
Data provider	An organisation or individual that publishes data on the internet.
Data consumer	An organisation or individual that retrieves data from a data provider.
Application	A software product, usually, but not necessarily, involving an interface for human interaction.
API	Application programming interface, a mechanism for two or more computer programmes to communicate with one another.
Trust Framework	A Trust Framework implements and automates the adoption of rules for data providers, aggregators and users, to share data securely at market-wide scale.
Security model	A structured approach to ensuring data and applications are protected against unauthorised access, use, disclosure, modification or destruction.
Assurable data	Data where the identity of the provider and the process by which it was produced can be verified.
Data provenance	The uninterrupted history of data providers and processing for a dataset.
ESO	The UK Energy System Operator, which performs several important functions; from second-by-second balancing of electricity supply and demand, to developing markets and advising on network investments.
DNO	In the UK electricity market, a DNO is a Distribution Network Operator, a licensed company that owns and operates the network of towers, transformers, cables and meters carrying electricity from the national transmission system and distributing it throughout the UK.
GDPR	The General Data Protection Regulation, a European Union regulation on personal data protection in the European Union and the European Economic Area, currently incorporated into UK data protection law.
Data licence	The legal terms under which a data provider makes data available for use.
Preemptive data licence	A pre-determined set of rules governing data sharing and use.
Open source software	Software whose source code is available for inspection, and that can generally be used by anyone for any purpose at no cost, as long as the licence terms are followed.
Open data	Data that can be used by anyone for anything for free.
Shared data	Data with a preemptive data licence.
Closed data	Closed data requires, if shared, a user-specific custom licence or contract for use.

For more information on data licensing, see: https://ib1.org/open-shared-closed/ .

Summary of technical outputs

Trust Framework participants

From a technical infrastructure perspective, stakeholders split into different groups, representing many hundreds of solutions providers (energy data, software, bank):

- **Energy data provider** (e.g. retailer, aggregator)
- **Carbon intensity data provider** (e.g. ESO)
- Permission giver, **SME** (the user of the energy to which GHG footprinting applies)
- **Software solution**, application or app (the carbon calculator that generates reports)
- **Bank** (recipient of reports)
- **Onward sharing** with assurance
- **Government** and regulators

In the time available, AG2 has assessed the technical requirements for energy data providers, SMEs, carbon reporting solutions and, to some extent, banks and auditors. The role of carbon intensity data providers have been partially considered[16]. Data sharing beyond banks has not yet been considered. These users also need to be mapped against the definitions of source, third-party providers (TPP), as per the definitions of Open Banking and Open Energy.

We reasonably expect that certain data flows will be addressed by contractual terms that do not require ongoing permission, but such actors (e.g. National Grid ESO and DNOs) may also join as part of the Perseus Trust Framework or via a relationship with the Open Energy Trust Framework. Forward data sharing to banks may be further enabled by terms embodied in the Perseus permissions. In this instance, the role of a carbon reporting solution changes from data user (of electricity data) to a data supplier (of reporting information to banks).

Consumption data

Example request/response

```
GET /consumption?from=2023-10-18Z&to=2023-10-19Z

“data”: [
  {
    “type”:”Electricity”,
    “from”:”2023-10-18T00:00:00Z”,
    “to”:”2023-10-18T00:30:00Z”,
    “consumption”: {
      “value”: 123.45,
      “unitCode”: “WHR”
    },
    “cumulative”: {
      “value”: 1234.5,
      “unitCode”: “WHR”
    }
  },
  {
    ...
  }
  ...
]
```

16 Carbon Intensity API (carbon-intensity.github.io)

Narrative

- Request must include **from** timestamp, **to** is optional and defaults to 'now'
- **type** must be 'electricity' (allows later expansion to gas, coal, etc.)
- **from, to a**re ISO8601 dates with 'Z' denoting UTC
- **from** is inclusive, **to** is exclusive
- Entries do not have to be contiguous - missing readings are not represented
- **consumption** and **cumulative** are Schema.org QuantitativeValue, including a numeric value and a CEFACT unitCode
- **unitCode** is one of the following CEFACT codes: KWH, WHR, JOU (later MTQ is a likely addition for gas)
- consumption
  - represents the electrical energy consumption between **from** and **to**
- cumulative
  - is the 'meter reading' - total consumption since a baseline that is defined in the meta data (see below)
- One or both of **consumption** and **cumulative** must be specified
- Data processors should use **cumulative** where available, as it is possible for individual consumption readings to drift
- **Note (2023-11-20):** Requirements for exported energy data are not yet available.

Tariff Data

Example request/response

```
GET /tariff?from=2023-10-18Z&to=2023-10-19Z

"data": [
  {
    "from":"2023-10-18T00:00:00Z",
    "to":"2023-10-18T22:30:00Z",
    "tariff": {
      "priceCurrency": "GBP",
      "unitCode": "KWH",
      "valueAddedTaxIncluded": true,
      "dayPartPrices": [
        {
          "from": "00:00",
          "to": "00:30",
          "price": 0.12345
        },
        ...
      ]
    }
  },
  {
    ...
  }
  ...
]
```

Narrative

- Request must include **from** timestamp, **to** is optional and defaults to 'now'
- **from, to** are ISO8601 dates with 'Z' denoting UTC
- from is inclusive, to is exclusive
- Entries must be contiguous. Missing entries must be merged with their preceding value
- **tariff** is a new entity borrowing from the Schema.org UnitPriceSpecification
- **priceCurrency** is ISO 4217 three-letter currency code, e.g. GBP, USD, EUR, etc.
- **unitCode** is CEFACT, as before
- **valueAddedTaxIncluded** is optional, default false
- **dayPartPrices** is an array of prices with the times they apply
  - from, to are times of day using the ISO8601 format for times without the 'T' prefix
  - from is inclusive, to is exclusive
  - price is the price in use for the from/to period
  - Taken as a whole, the array must span a full 24-hour period
- **Notes (2023-11-23):**
  - Further work required to define the format for weekend rates, standing charge, reserved capacity and fuel mix.
  - Further work required to harmonize this with standard tariff representations.
  - Requirements for export tariffs are not yet available.

Consumption metadata

Example request/response

```
GET /consumption?from=2023-10-18Z&to=2023-10-19Z

"metadata": {
  "datasources": [
    {
      "from": "2023-10-18T00:00:00Z",
      "to": "2023-10-19T00:00:00Z",
      "identifier": "abcd1234",
      "mpan": "abcd2345",
      "deviceId": "abcd3456",
      "cumulativeBaseline": {
        "takenAt": "2022-01-01T00:00:00Z",
        "value": 123.45,
        "unitCode": "KWH"
      }
      "datasourceType": "SmartMeter",
      "datasourceConfiguration": {
        ...
      }
    ]
  }
},
```

```
"data": [
  ...
]

FAPI metadata:
{
  "organisationId": "abcd1234",
  "permissionId": "5678efgh"
}
```

Narrative

- **datasources** contains information about the data sources used to provide the consumption data (this will usually be an array of one entry)
  - **from, to** are ISO8601 dates with 'Z' denoting UTC
  - **from** is inclusive, to is exclusive
  - **identifier** uniquely identifies the data source at the data provider
  - **mpan** (optional) is the Meter Point Administration Number for the supply point
  - **device** (optional) is an identifier for the physical device that provided the readings
  - **cumulativeBaseline** is the point from which cumulative data has been measured. It consists of three required elements:
    - **takenAt** is the timestamp when the baseline was established
    - **value** is reading for the baseline
    - **unitCode** is the CEFACT unit code
  - **datasourceType** is one of
    - **SmartMeter** - unchanged from a single smart meter
    - **SmartMeterProcessed** - derived from a single smart meter, e.g. daily converted to half-hourly using usage patterns
    - **VirtualMeter** - derived from partial or multiple meter readings
    - **MeterReadingOwner** - a manual reading of the meter by the owner
    - **MeterReading3rdParty** - a manual reading of the meter by a third party
    - **MeterReadingEstimateOwner** - an estimate of the meter reading by the owner
    - **MeterReadingEstimate3rdParty** - an estimate of the meter reading by a third party
    - **SpendBased** - consumption is based on energy spend analysis
    - **Other** - more information provided in datasourceConfiguration
  - **datasourceConfiguration** (optional) provides information about how the data source provides the readings, e.g. for a virtual meter this might have information about how the meter readings are subdivided
- FAPI metadata comes from the OpenID signature of the data transfer
  - **organisationId** is the ID of the energy data provider organisation within the Perseus OpenID Directory
  - **permissionId** is the ID of the permission record stored by the energy data provider that permits this data transfer
- **Notes (2023-11-20)**
  - Further work required to build out the details of the datasourceConfiguration information.

Tariff metadata

Example request/response

```
GET /tariff?from=2023-10-18Z&to=2023-10-19Z

“metadata”: {
  “datasources”: [
    {
      “from”: “2023-10-18T00:00:00Z”,
      “to”: “2023-10-19T00:00:00Z”,
      “identifier”: “abcd1234”,
      “mpan”: “abcd2345”,
      “deviceId”: “abcd3456”
      “datasourceType”: “SmartMeter”,
      “datasourceConfiguration”: {
        ...
      }
    ]
  }
},
“data”: [
  ...
]

FAPI metadata:
{
  “organisationId”: “abcd1234”,
  “permissionId”: “5678efgh”
}
```

Narrative

- **datasources** contains information about the data sources used to provide the consumption data (this will usually be an array of one entry)
  - **from, to** are ISO8601 dates with ‘Z’ denoting UTC
  - **from** is inclusive, to is exclusive
  - **identifier** uniquely identifies the data source at the data provider
  - **mpan** (optional) is the Meter Point Administration Number for the supply point
  - **device** (optional) is an identifier for the physical device that provided the readings
  - **datasourceType** is one of
    - **SmartMeter** - unchanged from a single smart meter
    - **SmartMeterProcessed** - derived from a single smart meter, e.g. daily converted to half-hourly using usage patterns
    - **VirtualMeter** - derived from partial or multiple meter readings
    - **Supplier** - tariff retrieved from an energy supplier
    - **TariffLookup** - tariff retrieved via a tariff lookup service
    - **ManualByOwner** - tariff provided manually by the SME
    - **ManualBy3rdParty** - tariff provided manually by a third party, e.g. a building manager
  - **datasourceConfiguration** (optional) provides information about how the data source provides the tariff, e.g. the tariff marketing name used in a lookup

- FAPI metadata comes from the OpenID signature of the data transfer
  - organisationId is the ID of the energy data provider organisation within the Perseus OpenID Directory
  - permissionId is the ID of the permission record stored by the energy data provider that permits this data transfer
- **Notes (2023-11-23)**
  - Further work required to build out the details of the datasourceConfiguration information.

Permission

Alignment with personal data protection

In line with AG3's decision, AG2 prefers the term '**permission**' to 'consent'. This is because 'consent' has a potentially more narrow definition in personal data protection than is necessary for SME data protection. We can anticipate, however, that Perseus may eventually extend to reporting by individuals (e.g. consumers or self-employed businesses and certain micro-businesses may fall under GDPR[17]), so we recommend that Perseus aligns as much as possible to the mechanisms required by GDPR and similar data protection legislation.

Permission records

- The energy data provider stores permission records
- Permission records **must** include:
  - **Who** provided the permission - e.g. a logged-in user
  - On whose **behalf** the permission is provided - e.g. the SME
  - **When** the permission was provided
  - **How** the permission was provided - e.g. the app version on such-and-such a device
  - **Which** data processor has the permission
  - For **what purpose** the specific permission record applies to
  - **How** the purpose was described to the user
  - **How long** the permission is valid for
- Both the carbon accounting platform and the energy data provider must provide mechanisms for the SME to review and withdraw permissions

Permission scopes

- AG2 expects SMEs to be able to choose how detailed the information they provide should be
- AG2 expects SMEs to be able to choose how the data may be shared 'upstream', for instance to a bank or as part of supply chain reporting
- The energy data provider **must** be able to provide logs of permissions granted and withdrawn to the SME or a platform permitted to access them by the SME
- **Notes (2023-11-20)**
  - The requirements for user preferences around detail and scope of sharing are not yet defined.
  - The period for which permission records must be retained is not yet defined.
  - The protocol for communicating, storing and retrieving permissions has not yet been defined.

Secure data exchange

Perseus authorisation and secure data interchange will use the FAPI 2.0 draft standard. FAPI enables secure peer-to-peer data exchange built using OAuth 2.0 and OpenID, where organisational credentials are verified by a trusted system, but data does not pass through the system, keeping liability clear. OpenID directories provide for automated discovery of services. The FAPI standard is published and maintained openly.

17 https://www.ofgem.gov.uk/information-consumers/energy-advice-businesses/guidance-microbusinesses

See appendix for FAPI permission and data flows.

Code examples

IB1 is developing example applications demonstrating the authorization and secure data exchange mechanisms using Python and JavaScript/React languages. At the time of writing these are not complete. When ready, they will be available with an Open Source licence at:

Example energy data provider

https://github.com/icebreakerone/perseus-demo-energy

Example carbon accounting app

https://github.com/icebreakerone/perseus-demo-accounting

Notes on the choice of a draft standard

- Although the standard is in draft, it is at an advanced stage of development and is already supported by several identity and authorisation platforms.
- Open Banking Ltd (formerly the Open Banking Implementation Entity or OBIE) is collaborating on the development of FAPI 2.0 and the expectation is Open Banking will move to FAPI 2.0 within the next few years.
- The 2.0 standard provides security and scalability improvements over the 1.0 standard.

Assurance

Assurance is based on **existence**, **provenance**, **completeness** and **accuracy**.

- Existence is a given - the data is being provided
- Provenance is somewhat covered by the data source types
- Completeness can be based on data time periods
- Data source information is a proxy for accuracy

Additionally, the Perseus Trust Framework must assure that data is **interoperable** - it can be combined readily with other data sources for the purposes defined in the trust framework.

IB1 has published a detailed set of Assurance levels for organisations and the data that they publish. These will form the basis of Perseus assurance. There is potential to further refine them based on the needs of stakeholders.

Notes

- Further work is needed to explore how the provenance of 'chains' of data providers (for example smart meter → building management system → 3rd party readout platform → carbon accounting platform) might be represented.
- It is possible that Perseus will define how these measures might be interpreted to give a standard indication of quality, but there is insufficient information to provide a technical point of view at this stage.

Barriers to technical implementation

AG2 identified the type of barriers that may be encountered in the technical rollout of Perseus. Further engagement with stakeholders will be needed to characterise and mitigate these.

- Platforms and tooling
- Technical knowledge and expectations
- Deployment lifecycle and interactions with other systems
- Approvals and sign-off
- Performance bottlenecks
- Feedback loops
- Non-technical concerns

How a Trust Framework operates

A Trust Framework is a very thin layer that enables the implementation of data sharing by:

a. Verifying and assuring that organisations are who they say they are.

b. Verifying and assuring legal permission is given to share data with the pre-agreed rules.

c. Enabling those permissions to be linked to rules for licensing, liability transfer and legal and operational processes (e.g. open standards for data, APIs, etc.).

To enable pre-authorised access to data, Trust Frameworks include verification and assurance services for organisations who wish to share, access and use data. Tiers for verification and assurance include verification and assurance at organisational and dataset levels:

1. **Organisational checks:** for example, confirming the organisation is a legal company entity with a membership agreement. Higher levels include KYC[18] checks.
2. **Organisational policy alignment and/or compliance with policies and standards:** for example, alignment with regulatory guidance, such as Open Data best practices; published data strategy; and, published net zero related reports (e.g. TCFD and PCAF).
3. **Dataset alignment and/or compliance:** for example, license checks for Open Data licenses; machine-readable meta-data; usage of Open Data Certificates; alignment with Data Sensitivity Classes; and, compliance with Trust Framework License Agreements.

The checks are made on two levels: organisational and machine. Organisations sign membership agreements that embody the rules. Machines check each other (continuously) to ensure that they have permission to share.

18 https://en.wikipedia.org/wiki/Know_your_customer

Research findings and outcomes

The scope for 2023 was to define, with a view to the long-term, what is required to deliver a *demonstrator* ready for COP28. Note that a demonstrator needs to support the narrative, but does not have to be an MVP or a technical proof-of-concept at this stage. Substantial progress has been made, however, towards a technical proof-of-concept.

The initial scope of Perseus is sharing electricity data about SMEs with carbon-accounting firms, with the permission of the SME. Note that non-functional requirements, such as security or compliance concerns, are for AG3 to identify. They are not part of the 2023 demonstrator. They are, however, a core element of the overall design and architecture.

Beyond the initial scope, we consider how the expansion of use cases, led by AG1, might impact how much of the processes and infrastructure can be reused and what additional rails and processes may need to exist to address these.

For the demonstrator we have created assets that involve:

- Data sources sharing data with applications
- User experience interface (application)
- Permission management
- Report generated (application) and shared with bank (with verification)

We have

1. Mapped out the technical infrastructure that will be required to enable the data to flow for (a) the demonstrator and (b) the longer term.
2. Defined how each participant integrates, including SmartDCC, Demand Logic, Sage, NatWest and others, as examples.
3. Identified relevant standards and practices that may apply to the full system.
4. Demonstrated the verification/assurance process.
5. Produced short slides and visual summaries of what's going on to communicate the approach to technical and non-technical audiences.
6. Created an FAQ that addresses the main questions in human-accessible language.

Challenges

- Lack of well-documented, openly available reference code for FAPI (and especially FAPI 2.0) in common languages will hamper early adopters.
- The UX and clarity of the permission process is key and needs careful design supported by extensive user testing.
- Carbon and ESG reporting frameworks are in a great deal of flux at present. While it is unlikely that this will impact the requirements for energy consumption and tariff data, the upstream requirements of the banks may shift due to demands from regulators and investors.
- Communicating data provenance is in its infancy, leading to challenges in representing it meaningfully in a machine-readable and scalable manner. AG1 work on assurance will input into this process, while AG2 will identify or specify appropriate formats and protocols to put provenance into practice.

Scope of work for top 10 areas of focus in 2024

1. Complete the detailed design of consumption and tariff data and metadata
2. Build a prototype implementation with member organisations
3. Define technical requirements for carbon intensity data providers
4. Define technical requirements for exported energy
5. Design the permission representation and data/API requirements
6. Create the chain of data provenance, upon which data assurance and trust mechanisms can be built
7. Define assurance measures and levels for Perseus
8. Connect and engage with organisations on a technical level to drive understanding and adoption
9. Create and publish documentation and reference implementations
10. Scope the technical requirements for at-scale rollout

9. AG3: Legal framework, definitions and needs

AG3 is co-chaired by IB1 and Pinsent Masons with over 20 members.

The role of this legal Advisory Group was to identify the scope of work to enable cross-sector, permission-based data sharing for the purpose of automating SME GHG reporting at national scale. This puts the legal basis for data sharing at the heart of the Perseus project, as a critical element to the success of data-led initiatives. Moving from a multitude of bilateral contracts to a 'common contractual and legal basis' is central to the Perseus Implementation.

A wide-ranging discussion established the central principles of compliance, clarity, transparency and SME protection. A range of barriers were identified, including: limitations to untangling data from sole traders and/or businesses within a single MPAN; defining and guiding the use and onward sharing of raw and derivative data; establishing clear contractual responsibilities of all potential ecosystem parties; defining the exact routes and frameworks for data access; addressing misconceptions regarding legal foundations for data sharing and processing; handling the potential and appropriate consequences for data misuse; and, establishing a clear liability framework to foster trust within the ecosystem.

The group works on the principles of fairness, transparency, compliance and protection of SMEs. The latter point is considered particularly foundational for establishing trust within the Perseus ecosystem. This is based on reflections from an SME representative that:

"Unlocking access to 30 minute resolution energy consumption data can be considered analogous to putting a CCTV camera in the heart of a business's operations."

Its scope for 2023 was to map out and define categories and guidelines including:

1. Basic principles and guidelines are defined and addressed for the demonstrator (which will be in a sandbox environment).
2. Identify what details should be explored and implemented in 2024 and beyond.

Research is being undertaken across several areas to supplement the core content addressed by the Advisory Groups to date.

The outcome we wish to see is one where the roles of stakeholders in the value chain are clear, the rights for data flow and use are clearly defined and the friction of data sharing and use is as low as possible. The end user (SME) must be empowered to opt-in to sharing electricity data for the purposes of:

1. Engaging them in the process to build trust.
2. Minimising liability for all stakeholders (not just the SME) and containing Scope.
3. Enabling data to be sourced, over time, from many different sources (e.g. energy retailers, aggregators, property-tech solutions and beyond).

Definitions

Framing the technical scope in a legal context requires definitions of entities and roles.

Consumption dataset ('raw data')	30-minute resolution electricity consumption data about an individual SME.
Carbon intensity dataset	30-minute resolution carbon intensity of electricity at the time and location of usage.
Report user	End-user of the reporting data: in this case a bank.
Energy data source(s)	e.g. retail supplier, aggregator, third party data service.
Data users	As mapped against the definitions of supply and usage based on their position and role in the data value chain, this also includes third-party providers (TPP).
Sustainability reporting ('derived data')	Definition of what constitutes sustainability reporting in the context of Perseus, including the types of data to be reported (e.g. kWh of electricity, carbon emissions).
Consent (for sharing personal data)	The ICO defines consent[19] to share personal data as: "any freely given, specific, informed and unambiguous indication of the data subject's wishes by which he or she, by a statement or by a clear affirmative action, signifies agreement to the processing of personal data relating to him or her."
Permission (for sharing a wider range of data types)	Permission is defined as the act of allowing an entity to do something and/or the act of allowing something to happen. Permission for sharing data incorporates, but extends beyond, the concept of consent.

Summary of user needs

For all parties clarity is required on the:

- Processes involved for data collection, use and processing
- Rules, licences, rights and responsibilities involved
- Benefits, risks and liabilities involved (business case, liability)
- Process for what happens when something goes wrong (redress)

SMEs need a seamless experience that they can trust. This means they must have a clear understanding of what is happening, that their data is accessed and used only for the purpose described and that they are 'covered' in some manner for misuse.

19 https://ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/lawful-basis/consent/

Energy data sources need to know that the data is able to be used for the permitted purpose, is protected against misuse and must be clear about the architecture of the Perseus solution.

Software applications need to know that they can access, use and process the data, what they are allowed (or not allowed) to do with the data and what benefits and/or exposure they may have.

Banks need to understand the process, benefits and risks. For example, on liability, accessing primary data may carry a lower risk (in terms of liability) than spend-based assumptions. This also applies to onward sharing.

Government and regulators need to know the legal basis for data sharing, what existing rules are applicable to Perseus and/or what additional rules may need to be applied to enable and/or protect stakeholders in the ecosystem.

Assessing the sensitivity of the data and its sharing is built on the principles of data sensitivity classes https://ib1.org/data-sensitivity-classes

Accessing energy data at market scale must be simplified

Perseus will enable trusted, assurable, comparable and actionable emissions reporting of GHGs by UK SMEs. To do this, we must facilitate automated, low-friction flows of primary sustainability data. The initial focus is on the flow of raw electricity consumption data and adjacent datasets (e.g. grid carbon intensity, tariff data, etc.) as distinct classes of primary data required for GHG reporting.

Later phases of the project will explore **onward sharing** of assurable, derived GHG emissions data with financial institutions (e.g. banks). This will support SME access to green financial products and support banks to accurately calculate GHG emissions embodied in their service and lending portfolios.

Today, access to electricity data is exceedingly complex, to the extent that there are more barriers to sharing electricity data than sensitive SME financial data. This is largely due to the fact that there are many different bodies, codes and legal contracts covering the access and use of electricity data, whereas current account data access is harmonised using Open Banking.

Electricity data is collected, stored and accessed through multiple gatekeeper organisations, some of whom hold overlapping datasets, but divergent access requirements and pathways. There is a failure of transparency regarding the details of the datasets held by different organisations and their currency. There are also extensive barriers to legitimate data sharing, even when requested explicitly by the SME, due to systems governing data accesses that are overly complex, prescriptive, change resistant and vulnerable to the exercise of vested interests among industry players. This system is not fit for purpose. It represents an active barrier to accessing vital information underpinning the low carbon transition. Improving sustainability data access is likely to require significant institutional and regulatory change.

Implementing Perseus will drastically simplify and speed up primary data flows underpinning accurate, trusted and assurable GHG reporting for UK SMEs. It will do this in a manner that can be rapidly scaled and provides flexibility around a range of sustainability data types relevant for different varieties of business and business operations. Making this change will enable the UK SME landscape to gain current, accurate and trustworthy information about the GHG emissions of their businesses and the options accessible to them to reduce these, including, but not limited to, the role that green finance will play in supporting change.

Research findings and outcomes

We have analysed four data value chain scenarios as defined by AG2.

1. There is no universal definition of SME used by actors in the electricity data landscape. No single actor holds all electricity consumption data produced by UK SMEs.	**Outcome:** Perseus shall use the UK government's definition of an SME. It will clarify this with stakeholders who may provide data to the system on an ongoing basis.
2. The smart meter rollout to SMEs remains partial (regardless of the SME definition used).	**Outcome 1:** Perseus shall, in due course, incorporate avenues to accessing 'dumb' meter data. This must not cut off avenues to access data via alternative sources in the behind-the-meter space (e.g. sub-metering in shared spaces under a single MPAN or consumer access devices).
	Outcome 2: This finding illustrates that the granularity of carbon accounting possible for differentially-metered SMEs will vary significantly. This has been identified as a potential risk to SMEs, particularly where businesses may not be able to control their metering arrangements (e.g. space-sharing by multiple businesses, issues with commercial landlords). The impact of differential metering arrangements on SME carbon reporting, and its relationship to service access in future (e.g. access to finance and interest rates), warrants further investigation to ensure that SMEs are not unfairly disadvantaged. This is illustrated in the Data Access Case schematics.
3. Access to Perseus-relevant data held by Smart Data Communications Company (DCC) is currently governed by accession to its 'other user' function. There are currently no avenues for organisations who are part of a Trust Framework to access the DCC as a group. However, this is being addressed.	**Outcome:** DCC accession for all carbon accounting providers in the Perseus system would be cumbersome and not cost-effective, demonstrating the clear need for a Perseus Implementation. Work is ongoing to engage alternative or altered access mechanisms that are interoperable with a Trust Framework. While some types of data access may be facilitated through other means (e.g. via the RECCo Electricity Enquiry Service, which is undergoing significant code changes designed to open up access to new users[20]), facilitating the full scope of data access may require legal or regulatory change. Pressure from the banking sector to establish the value of any required changes would be politically salient.
4. DCC other users are required to be SEC party members. Similarly to the above point, this is currently done on an individual/organizational basis only.	**Outcome:** Work is ongoing to establish the SECCo accession process and whether this is integrable with Trust Framework models. Work is ongoing to establish whether this may require industry codes and/or regulatory change to address. Pressure from the banking sector to establish the value of any required changes would be politically salient. This is particularly significant in light of a regulatory decision[21] by Ofgem in October 2023, which mandates the creation of a Trust Framework as an essential element of national energy data sharing infrastructure.

20 Including but not limited to modification R0118 https://recportal.co.uk/group/guest/-/review-of-schedule-12-and-processes-to-manage-access-to-data?p_l_back_url=%2Fsearch%3Fq%3Dr0118

21 https://www.ofgem.gov.uk/sites/default/files/2023-10/FSNR%20Overview%20Document%20Final.pdf

Scope of work for top 10 areas of focus in 2024

Areas for consideration include, but are not limited to, the areas below. Certain areas may require joint consideration with adjacent AGs.

These include, forming the legal principles on which Perseus will be built:

1. Definitions of key terms and competitive basis for an open market
2. Customer protection (including boundary conditions for onward sharing)
3. Security protocols
4. Transparency and disclosure
5. Regulation and oversight
6. Financial stability and risk management
7. Customer awareness and education
8. Data scope and granularity
9. Liability framework
10. Market monitoring

These are expanded as:

1. **Definitions of key terms and competitive basis for an open market:**
    a. Definitions of key legal basis, including the granting, withdrawal and amendment of permission.
    b. Access for third parties: draft legally binding agreements that allow third parties to integrate with Perseus without compromising competitive fairness or data security.
    c. Interoperability: define and articulate the legal aspects of how different systems and data sources can communicate and integrate with Perseus.
2. **Customer protection**
    a. Data protection: ensure SMEs retain control over their sustainability data - including raw and derived data where applicable - and that this data is handled in compliance with existing data protection laws and regulations, where applicable.
    b. Compliance: ensure that Perseus and relevant parties sign up to any relevant energy codes and explore avenues for collecting accession.
    c. Safeguarding SME interests: ensure that Perseus complies with applicable legal and regulatory obligations, taking account of the reasonable commercial interests of the SME.
    d. Grievance reporting: create mechanisms for SMEs and other stakeholders to record discrepancies in their own reporting or grievances with third-party platforms handling their data.
    e. Redress: define clear and proportionate pathways for redressing grievances that align with existing legal regimes where appropriate and create new pathways where there are gaps. Clearly establish the locus of responsibility and/or governance for grievance pathways and communicate this to all stakeholders.
    f. Misuse of data: determine the ramifications for misuse of data within the Perseus Implementation.
    g. Misuse of system: determine the ramifications for unauthorized access to or use of the Perseus system and/or other forms of misuse.

3. **Security protocols:**
    a. Standardization: establish legal standards for sharing and accessing data, using open standards methods, ensuring every stakeholder's legal responsibilities are clearly defined.
    b. Authentication and authorization: define and codify the Perseus authentication and authorization processes.
    c. Registration: create a legal framework for how entities can register to or become licensed to be part of Perseus.
4. **Transparency and disclosure:**
    a. Assurability: defining what is assurable data within the Perseus value chain.
    b. Transparency: legally define the boundaries and obligations of transparency for all stakeholders.
    c. Pricing and investment: ensure that pricing models and/or access fees are legally sound and transparent.
    d. Terms of service: draft comprehensive terms of service and end-user licence agreements for different stakeholders interfacing with Perseus.
5. **Regulation and oversight:**
    a. Enabling regulatory sandboxing.
    b. Understanding potential regulatory blockers.
    c. Regulatory landscape: ensure Perseus remains compliant with evolving UK and international regulations related to sustainability, finance, customer protection and data rights.
6. **Financial stability and risk management:**
    a. Fraud prevention: Lay down legal consequences for any fraudulent activity within the Perseus Implementation.
    b. Operational resilience: develop contracts that stipulate continuity and resilience expectations for service providers within Perseus.
7. **Customer awareness and education:**
    a. Information campaigns: work with the Communications AG to ensure that all educational and promotional content regarding Perseus adheres to relevant laws.
8. **Data scope and granularity:**
    a. Types of data: clearly specify and describe the types and granularity(ies) of data that Perseus participants can legally provide and/or access and/or process within the Perseus Implementation.
    b. Data access: determine and specify the data access conditions to be used within the Perseus Implementation. Determine and codify how these access conditions can be met and proved by system users in a manner that sensitively reflects user needs for transparency and confidentiality. Determine the roles and responsibilities of a Perseus governance body in supporting the above.
    c. Data licensing: draft and review the licences governing data sharing within the Perseus Implementation. Assess the applicability of existing data licences and/or licence clauses where appropriate. Create new data licences and/or licence clauses where appropriate.
    d. Reciprocity: legally outline the responsibilities and rights of stakeholders when sharing data with others within the system, as well as what stakeholders can expect to receive from the Perseus Implementation.

9. **Liability framework:**
    a. Dispute resolution: design a legal framework that clearly outlines how disputes are to be resolved, potentially including arbitration clauses. Ensure the framework aligns with existing regimes, where available, to avoid duplication and addresses any gaps in the current landscape.

    b. Insurance: determine the legal necessities regarding insurance coverage for stakeholders in the Perseus ecosystem.

10. **Market monitoring:**
    a. Evaluation: lay down legal guidelines for periodic reviews and audits to ensure the system's compliance and effectiveness.

    b. Feedback mechanisms: ensure any feedback or complaint mechanisms align with consumer rights laws and regulations.

AG3 must frame, structure, direct and enable the development of these elements with a meticulous approach, ensuring that the vision of Perseus is achieved within the confines of the law, while safeguarding stakeholder rights and interests and enabling open innovation to flourish. This is an extremely delicate balance — one of the most material project risks.

For the purposes of 2023, the priority was to validate that these are the correct areas of focus, including that they are complete or if there are areas that are not required, and

10. AG4: Communications and engagement goals, needs and outputs

AG4 is co-chaired by IB1 and Tide with over 25 members.

Based on the scope defined in AG1, AG4's purpose is to make clear to all stakeholders what Perseus is, how it operates and build trust to drive engagement with stakeholders. In 2023 (pre-COP) the target was orientation and support, with a view to scaling and driving adoption in 2024.

It aimed to lay the foundations for a communications strategy for Perseus, while developing a coordinated communications plan to use the voice of its members to build confidence, collaboration and trust across stakeholders.

AG4 uses the communications expertise of its members to plan and execute a communications strategy for Perseus, using our own networks and those of the Steering Group to reach our key audiences and strengthen relationships.

Summary user needs: communications goals

AG4 defined Perseus communications goals, before the implementation stage, as:

- Build a trusted **reputation** with the project's key audiences: steering group organisations, banks operating in the UK, the UK Government, solutions vendors and UK SMEs.
- **Increase awareness** of the value of Perseus
    - **a.** to small businesses
    - **b.** to banks
    - **c.** to software application vendors
    - **d.** around the world's climate goals
- Create **opportunities for stakeholders to engage** with each other and with Perseus, building strong and productive relationships.

Summary user needs: target audiences

AG4 explored specific target audiences to understand how we can reach them, what are their current perceptions of automated sustainability reporting between SMEs and banks and how do we need to shift those perceptions to make Perseus a success.

Our target audiences were:

A. Primary users:

- Banks
- SMEs
- Asset managers
- Third parties (e.g. accountants, accountancy software firms, carbon accountants, auditors, consultants and advisors)

B. Data providers:

- Primary data providers (e.g. energy companies, utilities, smart meter providers, national grid, asset managers)

C. Other stakeholders

- Government and regulators (DESNeZ, Ofgem)
- Standards bodies (e.g. PCAF, ISSB)
- Reporting bodies and users of outputs (e.g. CDP, LSEG, Bloomberg)
- Universities

A new Perseus narrative

AG4 developed a core narrative to explain what Perseus is and why it's valuable. It has also developed a slide deck to help deliver these messages.

1. **Perseus enables automated sustainability reporting for every small business in the UK, so that we can reduce emissions faster.** We're making it easy to share accurate, assurable data that sits behind emissions calculations.
   - Small businesses are responsible for about half of UK business emissions.
2. **Perseus creates the rules and processes that make automated reporting possible, making it easier to implement reporting standards.**
   - In turn, these rules enable a host of other products and services, such as emissions calculators, databases and reporting software. It will improve the quality and durability of the data they need and use.
3. **For SMEs, this eases the challenge of finding and sharing the reliable data they need to calculate their own emissions** and comply with complex reporting requirements.
   - 69% of SMEs don't know how to report carbon emissions.
   - That's why, in its first phase, Perseus will automate access to assurable energy data for business customers. They'll be able to see the emissions from their energy use and share it with their banks, which is more accurate than analysing emissions based on spend.
   - We need to make it easy for SMEs who don't have the resources, time or budgets to engage in this kind of complexity and are skeptical of how their data might be used. Perseus addresses automating the process and bringing protections to the use of data.

- Electricity is the first step. Other areas (e.g. other fuel types such as gas, water, transport, agriculture) will be addressed when (a) the business case is clear and (b) the data plumbing is in place to automate the process.
- Later, Perseus could help corporates accurately understand the emissions in their supply chains, help the insurance sector manage climate risks, help asset managers understand their asset risks and beyond.

4. **It will unlock more green finance by helping banks accurately understand the emissions of their customers** and their lending books.
5. **Because these rules will be used across the banking sector, carbon accounting applications and small businesses, a wide range of organisations are working together to create them.**
    - Perseus is a non-profit project bringing together trade associations, regulators, government, standards bodies, small businesses, corporates and banks.
    - They are working together on a pre-competitive basis - working side-by-side to solve a shared problem.
    - Perseus has been endorsed by the Minister for Energy Security and Net Zero and is included in the UK's Green Finance Strategy.

Publicly usable assets are online at:

- https://ib1.org/perseus/perseus-media-pack/
- How to talk about Perseus - a one-page messaging guide (Google Doc)
- Slide deck for use in any internal or external comms (Google Slides)

Scope of work for top 10 areas of continued focus in 2024

Develop key messaging for the project as a whole and for each audience/stakeholder group:

1. Plan and execute activity to reach our audiences
    - Stakeholders: identify and activate the most powerful messengers and voices for us to mobilise to achieve our goals (e.g DESNZ to bank CEOs, ICAEW to SME accountants)
    - SG members
    - AG members
    - Open newsletters (via SG members and commercial partners)
    - Open webinars (run members/partners, supported by IB1)
    - Press releases
2. Develop content
    - Use case(s)
    - Business case(s)
    - Words, images, video
    - Contact lists (e.g. media contacts)
3. Develop plan and preparation for reputation management
    - Proactive identification of questions/issues - added to FAQ
    - Transparency/publishing - open statement of approach to this
    - Monitoring
    - Response process and names individual spokesperson(s)
    - Open review and publishing of any incidents

Testimonials

The most important voices in the development of Perseus are those of its stakeholders. Herein are public statements from across the Perseus constellation.

Rt Hon Graham Stuart MP, Minister of State for Energy Security and Net Zero
"The Government is supporting the Project Perseus initiative with its inclusion in the Green Finance Strategy 2023 and via the British Business Bank, which co-chairs the project's Steering Committee. The project has already attracted immense international interest, with institutions including the Organization for Economic Cooperation and Development, the World Energy Council, the United Nations Environment Programme Finance Initiative and the International Chambers of Commerce sitting as observers on the steering committee. Further international counterparts are in the process of joining. The project will also play a key role in supporting the work of the newly-established Net Zero Council, which I co-Chair with Shirine Khoury-Haq, the CEO of Co-op. "Your participation and support is essential to ensure the success of the project. I encourage you to join Bankers for Net Zero and support Project Perseus to establish a scalable strategic framework for driving the decarbonisation of SMEs. The scale of the challenge is immense, but I am confident that it is achievable with commitment, collaboration, coordination and material support from the private sector."
Michael Izza, Chief Executive, ICAEW
"We are proud to support Bankers for NetZero and to be part of the Perseus Steering Group for sustainable reporting. Its SME Disclosure Platform will enable millions of small businesses to share reliable data easily with their funders and supply chains, which will be a vital contribution in the successful transition to a decarbonised economy."
Adam Jackson, Director of Policy and Net Zero lead, Innovate Finance
"Innovate Finance is delighted to support Project Perseus. FinTechs include the challenger banks and alternative lenders, who provide over half of all small business finance in the UK; software and regtech solutions, that enable banks and small firms to measure and report on emissions; and start ups and scale ups, who need to measure and reduce their own emissions. Project Perseus is building data solutions that will enable everyone to achieve net zero faster across this ecosystem."
Jonathan Geldart, Director General of the Institute of Directors
"More and more small and medium-sized businesses want to be part of the race to net zero, but currently face challenges when seeking to measure and report their carbon footprint. By developing a solution to automate greenhouse gas (GHG) reporting for every SME in the UK, banks will be able to better manage climate risk and SMEs will gain improved access to capital to invest in net zero. We are delighted to be a member of the Perseus Steering Group, supporting the project's work to keep us on the pathway to a healthy, growing net-zero economy."
Martin McTague, National Chair of the Federation of Small Businesses
"Small firms play a crucial role in the UK's transition to net zero and are already taking action to combat climate change. The lack of tools to measure carbon footprints and barriers to access to finance are among the challenges faced by small firms on their net zero journey. But, with the right support, small firms can overcome these and will be able to go further. We're glad to be a part of this Steering Group to help shape green initiatives that could work for the small business community."
Eric Usher, Group Head, United Nations Environment Programme Finance Initiative (UNEPFI)
"As convener of the Net-Zero Banking Alliance, we welcome the next stage of implementing Project Perseus. The data generated by platforms like this will provide critical insights on the progress of net-zero efforts in the UK and will pave the way for similar frameworks around the world."

Louis Taylor, CEO, British Business Bank
“One obvious challenge is making greenhouse gas emission measurement and reporting proportionate for SMEs. After all, we've got to know where we're starting from if we're going to know the route to where we want to get to. Perseus aims to solve the problem of scalable, proportionate, indeed frictionless emissions reporting for smaller businesses, with data that is assurance grade for the clients of the SMEs, and also for their auditors.”
Tim Lord, Head of Climate Change, HSBC UK
“We are really pleased to continue supporting B4NZ with Project Perseus. The UK’s 5.5 million SMES have a vital role in the economy and the development of a standardised reporting framework can help them seize the opportunities of the transition to net zero. We understand the important role we play in helping our customers to successfully navigate that transition and are providing support to SMEs through our SME Green Fund and new Sustainability Tracker tool.”
Zarina Banu, Head of Communications, Tide
"For Tide and many banks, the quality and lack of standardisation of emissions data we receive is too low to base decisions on or offer support where needed. This isn't the fault of small businesses - they're overwhelmed. Solving this is a priority. This is why Tide is collaborating with a host of other banks and organisations on Perseus to enable automated energy reporting for every small business in the UK."
Hugh Garnett, Senior Programme Manager, Institutional Investor Group on Climate Change (IIGCC)
“IIGCC is delighted to join Perseus’ Steering Group. Access to assurable data is key for financial institutions on their journey to net zero and is vital in incentivising financial innovation.”
Karen Ellis, Chief Economist, WWF UK
“WWF supports Perseus as a core effort in facilitating credible corporate sustainability disclosure. As the beating heart of the UK economy, SMEs must be supported in the transition to a net zero future. Perseus' effort to simplify sustainability reporting for small businesses and enable cross-industry collaboration is a crucial element of the decarbonisation architecture required to ensure the UK reaches its emissions reduction targets. Access to robust data is critical for financial institutions on their journey to net zero and supports credible, impactful transition plans. We look forward to seeing this pilot programme take off.”
George Sandilands, VP Sage Earth, Sage
"As small businesses are responsible for a quarter of all greenhouse gas emissions, it is clearly not possible to achieve net zero without helping them to decarbonise, but policies and initiatives overlook this sector. Perseus is laying the foundations that will automate reliable, high-resolution reporting data directly relating to small business emissions. It will revolutionise the ease and accuracy with which small businesses can measure, manage, report and reduce their emissions, helping them to access finance, supply businesses and public sector organisations with decarbonisation commitments and, most importantly, reduce their impact on our climate."
Andrew Griffiths, Director of Policy and Partnerships, Planet Mark
“Planet Mark certify the carbon footprints of 700+ organisations, the majority of whom are SMEs. If a clear methodology can be devised for energy data to be shared directly with our carbon accounting software from energy providers and/or smart meters with the permission of organisations, then it massively simplifies the data gathering process for both the reporting company and us and simultaneously increases confidence in the accuracy of the data provided by cutting out any risks of human error. We can use the raw data to directly calculate carbon emission consumptions at substantially greater frequency, allowing reporting companies to receive continual feedback throughout the year on their progress and identify opportunities to achieve energy savings more quickly.”

Nika Safonova, SME Product Specialist, Cogo
"As a leading provider of carbon management solutions for SMEs, we focus on building experiences that maximise SMEs engagement and drive action. We use the spend-based method to provide businesses with a quick start and complement with activity data for additional accuracy where it matters. The automated activity data feed standardised through the Perseus Project framework and infrastructure will enable us to deliver seamless experiences to produce highly accurate footprints with little effort required from SMEs. We deliver carbon management solutions to banks' SME customers to maximise access to quality carbon management and drive carbon reduction by facilitating access to green finance through better data, which Project Perseus will help us automate further."
Dr Gabrielle Bourret-Sicotte, CEO and Co-Founder, Greenr
"The collaboration between Greenr and Perseus has proven highly advantageous. Working alongside regulators, government entities and financial leaders has granted us valuable insights into the nuances of carbon regulation. This understanding not only enhances our adaptability, but also strengthens Greenr's core mission of involving the workforce in sustainability. By systematically reducing emissions at their source, we aim to contribute to achieving net zero in alignment with the Paris Climate Agreement. We eagerly anticipate the ongoing partnership with Perseus, committed to enhancing carbon reporting across the board."
James Close, Head of Climate Change, NatWest Group
"As the UK's biggest bank for business, we want to make it as simple as possible for SMEs to unlock the revenue and growth opportunities of a sustainable economy. Through the NatWest Carbon Planner, we have helped thousands of businesses to estimate their carbon footprint and generate tailored actions to reduce their emissions, make efficiency savings and become more competitive in the process. The Perseus programme is the next step in making emissions reporting simpler for small businesses. By automating greenhouse gas reporting for UK SMEs, this programme takes the stress and complexity out of the reporting process for small businesses, while providing standardised and comparable reporting data to unlock investment in the transition."
Jaya Chakrabarti, founder, TISCreport/projectvana
"As a corporate transparency platform, we want to be able to connect to other data sets that help external stakeholders assess those corporate entities for their ESG impact. We also want to enable scaling through supply chains. Our focus has been on the human rights side of the equation, but environmental justice is inextricably linked with social justice. We see the work being done in this group as critical to the data infrastructure we all need to play our parts."
Nick Carmont Zaragoza,CTO and Co-Founder, Connect Earth
"I think the Perseus project will have a vast impact in standardizing and facilitating emissions reporting and reduction."
Phillip Schauer, Technical Assistance Lead and UK Chapter Lead, PCAF
"Based on our understanding of Perseus, it would seem to increase the PCAF data quality scores outlined in the standard."
HM Government, Mobilising Green Investment, UK Green Finance Strategy
"The UK government is working with Bankers for Net Zero, the British Business Bank and a range of industry stakeholders to automate SME sustainability reporting on a national scale... building on both Open Banking and Open Energy."

11. AG5: Policy and regulatory needs

AG5 is co-chaired by IB1 and PlanetMark with over 30 members.

Policy has an essential role in enabling an open market to operate, while maintaining protections for its stakeholders. Perseus is building on established and emerging frameworks, such as Open Banking and Open Energy.

Bringing stability and trust to data sharing will enable the market to invest

The AG5's group's focus is guided by the Scope in AG1. It directly supports, and is supported by, the work in AG3 (Legal) and AG2 (Technical). The outputs and requirements created from AG5 will be used by AG3 and AG2 to ensure that policy requirements are codified in legal and technical implementations.

AG5 works closely with AG3 (Legal and Licensing) on key areas, such as definitions, compliance, data rights and regulatory sandboxing. It identifies potential policy interventions that enable implementation and addresses market incentives and protections. It maps out what policies and codes will be required to enable data to flow.

Its scope considers the expansion of the initial use case and what rails and processes may need to exist to address these.

AG5 has mapped and prioritised areas of policy engagement that are critical to enable Perseus to scale into a solution for automating the sharing and analysis of energy data across the whole of the market. It has mapped various policy areas and conducted a survey to identify the group's priorities to map into actions for 2024.

Its scope for 2023 was to map out and define categories and guidelines including:

1. Ensure basic principles and guidelines are defined and addressed for the demonstrator (which is expected to be in a sandbox environment).
2. Identify which areas should be explored, designed and implemented in 2024.
3. Identify categories for development beyond 2024.

Research is being undertaken in several spheres to supplement core content addressed by the Advisory Groups to date.

We have established relationships with key players in the electricity data access and governance space to establish what governance, technological and socio-political barriers exist to sharing the data required to operationalise the electricity data use case. Work has also sought to explore potential avenues for change.

Primary stakeholders engaged include the Retail Energy Code Company (RECCo); Data Communications Company (Smart DCC); the Smart Energy Code Company (SECCo); Ofgem; Department of Energy Security and Net Zero (DESNZ); and, the UK Smart Data Council.

Definitions

Code(s)	Multi-party agreements (sets of rules or guidelines) that are established and governed collaboratively by code signatories and regulatory authorities to set out the rules by which the energy industry[22] operates. Codes are 'live' documents to which signatories and certain external parties can propose modifications. Modifications can support codes to evolve in line with changing conditions of operation in the broader industry - e.g. to support new rules for data sharing as the sector digitalises and demand for data increases. Such rules are designed to ensure that the collection, use and reporting of data are done in a way that is safe, accurate and fair. This is of particular relevance to Perseus, as the data will flow across sectors and potentially touch on multiple codes.
Office of Gas and Electricity Markets (Ofgem)	The energy regulator for Great Britain, Ofgem is responsible for regulating monopolies and markets in the energy sector, establishing and enforcing price controls, protecting consumers and supporting the industry to transition to net zero GHG emissions.
Privacy and data protection	How personal and business data will be protected in accordance with regulations.
Retail Energy Code (REC)	The REC is a multi-party agreement that establishes and maintains key rules by which companies must abide by to operate in the British retail energy market. The REC is managed by an independent organisation - the Retail Energy Code Company (RECCo)[23].
Smart Energy Code (SEC)	The SEC is a multi-party agreement governing the rules, rights and obligations of energy networks, suppliers and other relevant parties involved in the management of smart metering in Britain. The SEC is managed by an independent organisation - the Smart Energy Code Company (SECCo)[24].

22 A full list of energy industry codes can be accessed here: https://www.ofgem.gov.uk/energy-policy-and-regulation/industry-codes-and-standards (2023)

23 https://www.retailenergycode.co.uk/

24 https://smartenergycodecompany.co.uk/

Summary of user needs

AG5 identifies potential policy interventions that will enable implementation and address market incentives and protections. It maps out what policies and codes will be required to enable data to flow.

These users need to be mapped against the definitions of data source, third-party provider (TPP) and user, as per the definitions of Open Banking and Open Energy. These include the SME, energy data source(s), software applications, accountants and auditors, banks and government.

SMEs need a process that they can trust, which affords a process of redress when errors occur. They must have a clear understanding of their rights and that their data is accessed and used only for the purpose described. They must also be protected from unintended consequences and/or issues that may restrict their access to capital.

Energy data sources need to know that they and others in the data value chain have permission to share data with trusted third parties and a clear sense of their own liabilities and responsibilities in the value chain.

Reporting software applications need to know that they can access, use and process the data, what they are allowed (or not allowed) to do with the data and what benefits and/or exposure they may have.

Banks need to trust that the process enables them to access, use and share derivative reporting data and, where appropriate, profiling data that is within the scope of application. They must also be protected from unintended consequences and/or issues that may restrict their ability to deploy capital.

Government and regulators need to know the legal basis for data sharing, what existing rules are applicable to Perseus and/or what additional rules may need to be applied to enable and to protect stakeholders across the ecosystem, including SMEs.

Research findings and outcomes

We are delighted to report that we have initiated work with the Retail Energy Code to lay the foundations for utilisation of smart meter data for environmental purposes. The first stage of this work was completed before COP28.

For Perseus, whether mandatory or voluntary, codes will be developed and/or applied on how to measure and report electricity usage, how to handle and protect the data of companies and individuals and to ensure that the information reported is true and reliable. These will ensure that those involved in Perseus are working towards impact in a manner that is approved and guided by the rules set by regulatory bodies or collaboratively agreed by common contract.

Policy outcomes must encourage participation, enable prioritisation and lay potential basis for internal policy mandates (e.g. via procurement) and potential regulated interventions or areas for intervention. These could range from Code change(s) to DESNZ policy positioning to highlight potential SME protections, to the scope for the creation of tax incentives, if such potential arises. The group also considers compliance and alignment with standards bodies, such as PCAF, utilisation of GHG Protocol and reporting frameworks, such as CDP.

1. Access to Perseus-relevant data held by RECCo has been simplified via code modification R0118, approved in November 2023. This modification will **enable parties to be added to the data access mechanism** (enquiry service) **without undergoing a full code modification.**	**Outcome:** this change establishes the context and needs for simplified data access, which lays the foundations for what we are developing. It does not yet fully solve data access for Members, as the system still focuses on individual organisational access and permissions (as illustrated in the RECCo Electricity data access matrix[25]). Work is ongoing to draft **a new type of data access agreement that would be compatible with a Trust Framework model.** There is considerable political opportunity for leadership here that would be influential, not only across the electricity sector, but also for other infrastructure data providers.
2. RECCo is considering a further modification that would enable **'classification-based' access to data** via the enquiry service. This change aims to promote better classification and publishing of open data particularly. It also proposes changes to the way in which more sensitive data is analysed.	**Outcome:** although this set of open data is not relevant, there is opportunity for Perseus to influence the progression of this modification, including a potential opportunity to provide education - and potentially align - on models of **data sensitivity classification.** This requires significantly more work to establish and will be ongoing into 2024.
3. Alignment around the standards and methodology highlighted by AG1 must be framed as **a compliance condition of being a Perseus Member.**	**Outcome:** common alignment around usage of the **GHG Protocol** (location-based, market-based calculation methodology) as described in this report and with **PCAF** (financed emissions).
4. Alignment around public sector strategic development.	**Outcome:** members are prioritising SBTi commitments and Carbon Reduction Plans (CRPs) under UK Procurement Policy Note 06/21 (PPN 06/21[26]).

Scope of work for top five areas of focus in 2024

Overview of related work areas

Areas for consideration include, but are not limited to, the areas below. Certain areas may require joint consideration with adjacent AGs. The top five priorities identified by AG5 Members through anonymous survey were:

1. Identifying and addressing any regulatory issues that will affect scaling the demonstrator for energy data sharing.
2. Exploring the policy implications of the types of data/sustainability metrics being handled by Perseus, including Data Protection issues and ensuring that SMEs have control of their confidential data.
3. Defining rules around interoperability to ensure that Perseus systems work seamlessly with accounting applications, banking platforms, energy companies etc.

25 https://digital-navigator.azurewebsites.net/dataspec

26 Procurement Policy Note 06/21: Taking account of Carbon Reduction Plans in the procurement of major government contracts - GOV.UK (www.gov.uk)

4. Identifying and addressing barriers to data access/measurement for SMEs (e.g. landlords being unwilling to share energy data).
5. Guidelines for competition and innovation to ensure access for a diverse range of third party sustainability analysis firms.

Areas for wider consideration include, but are not limited to:

1. **Regulation and oversight:**
    a. Licensing and registration: setting criteria for third-party platforms or entities wishing to collaborate with or operate within the Perseus Trust Framework. Verification and assurance of such to be collaboratively defined between the parties and implemented and aligned with https://ib1.org/assurance.
    b. Regulatory collaboration: working alongside UK regulators to ensure Perseus remains compliant, as well as financially, environmentally and socially beneficial.
2. **Transparency and disclosure:**
    a. Pricing: being transparent about any costs associated with services or third-party integrations.
    b. Terms of service: clear guidelines for applications and banks about how Perseus functions, what they can expect and their responsibilities.
3. **Data scope and granularity:**
    a. Types of data: defining the exact sustainability metrics and granularities that Perseus handles, from carbon footprints to other ESG factors.
    b. Data reciprocity: encouraging sharing of insights derived from data acquired through Perseus - such as best practices in sustainability - back through the Perseus Implementation.
4. **Customer awareness and education:**
    a. Information campaigns: educating SMEs and related stakeholders about the advantages of automated sustainability reporting and how to use Perseus effectively. An FAQ that addresses the main questions in human-accessible language.
    b. Transparency initiatives: regularly update stakeholders about any changes, improvements or challenges faced by Perseus and ensure that these changes are documented and published appropriately.
5. **Customer protection:**
    a. Data protection: ensuring SMEs have control over their sustainability data and that this data is handled confidentially.
    b. Redress: mechanisms for SMEs and other stakeholders to report discrepancies in their reporting or grievances with third-party platforms handling their data. Define scope of processes for material redress.
6. **Security protocols:**
    a. Standardisation: adopting consistent protocols for transferring and accessing sustainability data from banks and other relevant institutions.
    b. Authentication and authorization: validating SME identities before accessing or transferring their data and setting permissions for who can view or use this data. Centred on customer fairness, ensure that it's being used in a responsible way.

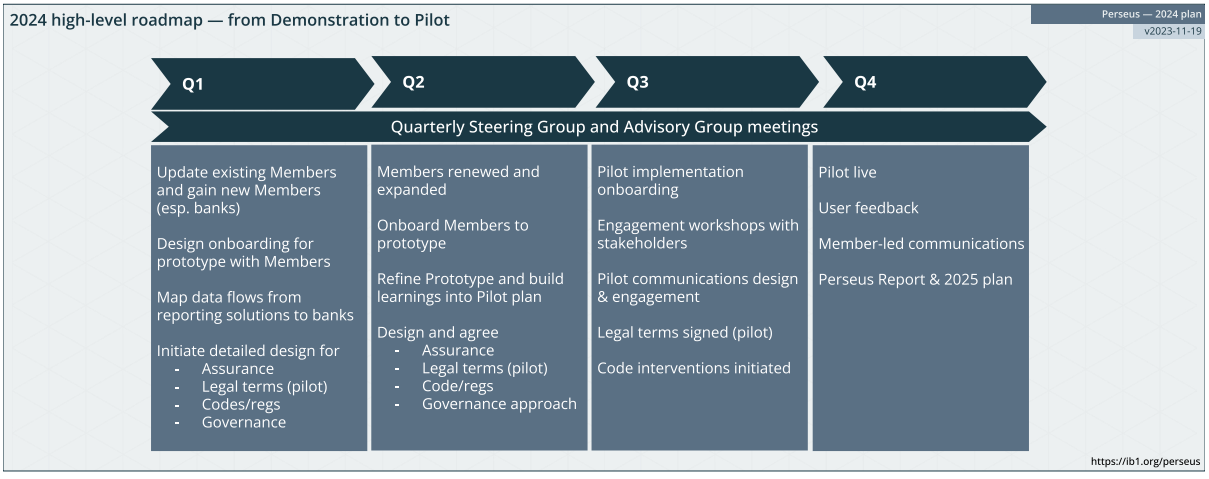
7. **Liability framework:**
    a. Dispute resolution: identifying and signposting appropriate external pathways to address any discrepancies between reported data and actual sustainability practices.
    b. Insurance: considering protections for SMEs, applications and/or banks in case of reporting errors or other liabilities.
8. **Financial stability and risk management:**
    a. Fraud prevention: mechanisms to detect false sustainability reports or manipulation attempts.
    b. Operational resilience: ensuring Perseus and its affiliates can operate under various challenges, from cyberattacks to large volumes of reporting.
9. **Competition and innovation:**
    a. Access for third parties: enabling diverse sustainability analysis firms or platforms to access data if they adhere to Perseus' guidelines.
    b. Interoperability: ensuring Perseus' systems work seamlessly with banking platforms, accounting applications, energy companies and other relevant entities.
10. **Market monitoring:**
    a. Ecosystem evaluation: monitoring how effectively Perseus is bridging SMEs, banks, applications and sustainability goals.
    b. Feedback platforms: encouraging users, especially SMEs, applications and banks, to provide feedback to continuously improve the system.
11. **Internal policies**
    a. Identifying the baseline for the banks that can be aligned around.
    b. They must identify what they would like to see from the carbon calculator providers - this is the baseline we want to align around.
    c. Internal policy/departments will have key targets we need to be aware of and influence.

12. 2024 Scope and considerations

The Steering and Advisory Groups have validated the functions and capabilities that are being delivered by existing partners and the wider constellation/ecosystem are aligned with their needs.

Collaboration is key to the success of this project. Priorities for 2024 include engagement, governance, funding and implementation to:

1. Promote the project widely and engage with additional stakeholders.
2. Deliver an operational prototype, minimum viable product (MVP) and minimum viable implementation with end users.
3. Further formalise the decision-making processes for prioritisation and to decide which elements are taken forward into implementation (data value chain design, legal, rights, policy), demonstration, sandboxing, MVP and implementation.
4. Design and implement governance in collaboration with members: design the long-term governance and define and agree the pricing model for functions and capabilities in the context of a whole-of-market pricing framework.
5. Improve information flows with data and third-party providers and end users: perform a gap analysis of, and advise on, what is required to ensure consistent and accurate data sharing and service status messaging. Ensure effective customer protection: research and design dispute processes and develop proposals for a dispute process.
6. Design a monitoring framework for service availability and performance, as well as collecting and analysing that data.



Perseus members have endorsed that the scope for 2024 be expanded and:

Must

- Address areas beyond electricity (e.g. other energy types, water, agriculture).
- Apply the principles of data assurance through the value chain, from electricity consumption data to software tools.
- Apply the principles of data assurance, from software reporting tools to banks, to enable appropriate provenance to be assured in the delivery of SME reports that are then used by the banks in their Scope 3 Category 15 reporting.
- Address appropriate and relevant onward data sharing of both derivative analysis (e.g. reportings) and *primary* (raw consumption) data from the SME, through software tools, to banks to enable personalised analysis and recommendations on a continuous basis. Transparency around the boundaries and processes for onward sharing are key to a trustworthy ecosystem.

Should

- Future scope considerations should be considered for inclusion:
  - Utilisation of the same framework to enable reporting data to be shared across the market (as part of Scope 3 reporting).
- For a specific time period and Meter Point Administration Number (MPAN), to return:
  - HH generation data per tariff, per supplier (to allow calculation of true carbon-free energy, CFE%).
- Utilisation of the same framework internationally (e.g. 'twinning' with another NZBA country to develop a cohesive approach).
- Enabling meaningful interoperability with key reporting initiatives (e.g. CDP).

Could

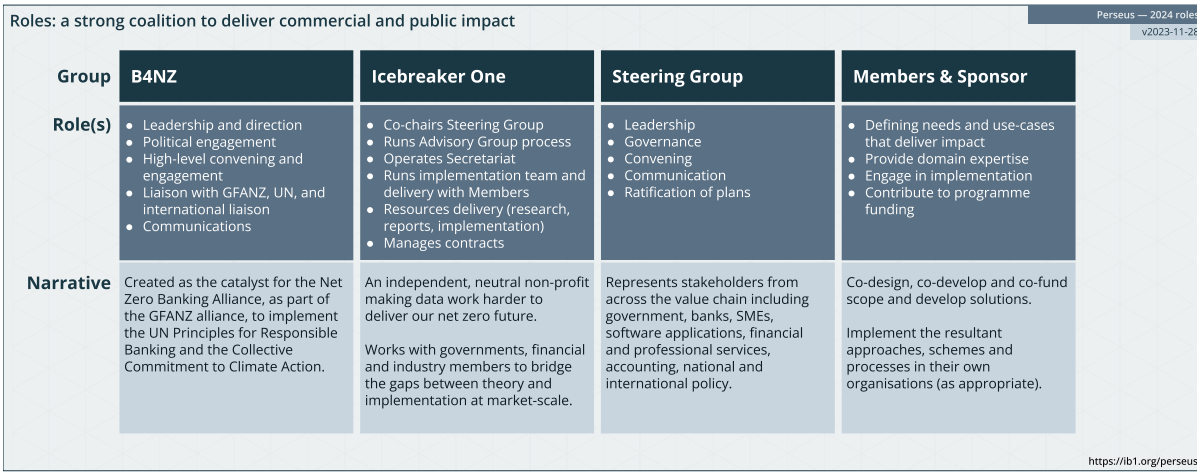
- Include onsite generation data.
- Future scope that could be considered for inclusion:
  - Utilisation of the same framework to extend downstream (domestic).
  - Utilisation of the same framework to extend upstream (enterprise).
  - Utilisation of the same framework for other sectors (e.g. other forms of finance, insurance, asset management, etc).
  - Such considerations may be beyond the scope of work and its relationship with the NZBA umbrella.

Note

To cover the whole of the UK, we note that Northern Ireland has different regulatory regimes and infrastructures (e.g. UREGNI[27] regulates the energy market, not Ofgem) that may affect the data value chain in different ways.

27 https://www.uregni.gov.uk

13. The Perseus Constellation



Principal: Bankers for Net Zero

Launched ahead of COP26 by the United Nations and UK Government, Bankers for Net Zero (B4NZ) convenes the UK Country Chapter of the UN-Convened Net Zero Banking Alliance, the first and only initiative of its kind in the world. Today, B4NZ is a non-profit initiative bringing together banks, businesses and regulators to enable them and their clients to accelerate the transition to net zero. Our focus is strategic policy alignment – by creating clarity on which areas of the net zero transition require policies that can optimise the contribution banks can make to the real economy. We enable policymakers and banks to play their part in accelerating the transition to net zero. We lead a number of market leading sectoral workstreams across energy efficiency, decarbonising SMEs/ supply chains and accelerating regenerative farming practices, including the SME Advisory Group for the Transition Plan Taskforce. A recognised sounding board for bold climate policymaking, B4NZ also sits on the Department for Energy Security and Net Zero's Net Zero Council and the ConstructZero partnership with the Department for Business and Trade.

Co-chair, implementation lead and secretariat: Icebreaker One

Icebreaker One is a UK-headquartered independent, global non-profit that aims to connect private and public sector leaders to help transform the climate crisis into economic innovation. Its mission is to make data work harder to deliver net zero, working across finance, energy, water, agriculture, transport and the built world. It leads and supports market-scale, national and international data governance programmes, including Open Energy, SERI (Standard for Environment, Risk and Insurance), STREAM, Mission Innovation and the Future of Sustainable Data Alliance. Its team was instrumental in the creation of the Open Banking Standard in the UK and other countries and its CEO co-chairs the UK Smart Data Council.

Steering Group

Principal: B4NZ

Co-chairs: British Business Bank (BBB), Icebreaker One

Members: Institute of of Chartered Accountants in England and Wales (ICAEW), Innovate Finance, Institute of Directors (IoD), British Chambers of Commerce, Department for Energy Security and Net Zero (DESNZ), Cabinet Office, UK Finance, Energy UK, Federation of Small Business, ScaleUp Institute, Lending Standards Board (LSTDB), Engineering and Machinery Alliance (EAMA), TheCityUK, Volans, Startup Coalition, CDP, Open Banking Implementation Entity (OBIE), Confederation of British Industry (CBI) and Innovate UK (IUK).

Observers

Partnership for Carbon Accounting Financials (PCAF), Association of Chartered Certified Accountants (ACCA), International Finance Corporation (IFC), International Chamber of Commerce (ICC), World Energy Council, Financial Conduct Authority, Institutional Investors Group on Climate Change (IIGCC), Organisation for Economic Co-operation and Development (OECD), IFC, Rebeccanomics (independent), UNEPFI, SME Commission at UK Finance, We Mean Business Coalition and the Parliamentary Renewable and Sustainable Energy Group (PRASEG).

2023 Founding Partners	2023 Commercial Partners
Allica	Clear Bank
British Business Bank	Climate Clarity
Carbon Laces	Climate Essentials
Cogo	Development Bank of Wales
Connect.Earth	Greenr
Demand Logic	ICAEW
Enerlytics	Intuit
HSBC	NetZeroNow
NatWest	Open Bank Project
Normative	Openvolt
Perse Energy	Our Carbon
PWC	Carbon Trust
Radiant AI	Planet Mark
Sage	SSEN
SmartDCC	Small 99
Tide	Surple
	Swishfund
	Visa
	West London Business
	Scottish & Southern Electricity Networks

Governance, risk and reporting

The Steering Group (SG) is co-chaired by IB1 and the British Business Bank, with 19 members and 15 observers.

Rapid development: forming, storming, norming and performing

Perseus is a deliberately ambitious programme that has been co-designed and developed at pace, with partners. All parties involved in a formal capacity have signed a Terms of Reference that frames the vision, mission, values, principles and practices of the programme.

The role of the SG in 2023 has focussed on convening, providing direction and feedback. A formal governance structure will be established in 2024 with an additional project team with a subset of the SG seconded to oversee financial, risk and reporting requirements as the scale of the programme grows.

IB1 shall continue to lead implementation and provide secretariat functions. B4NZ shall continue to act as political liaison. Each organisation is contracted separately by Members.

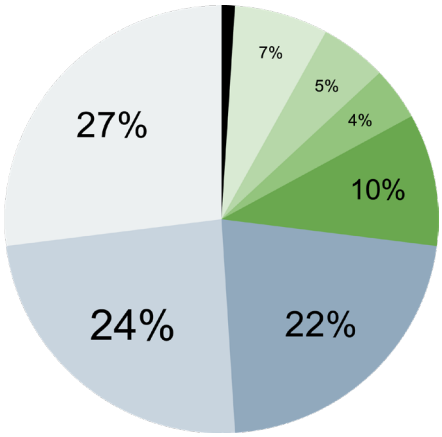
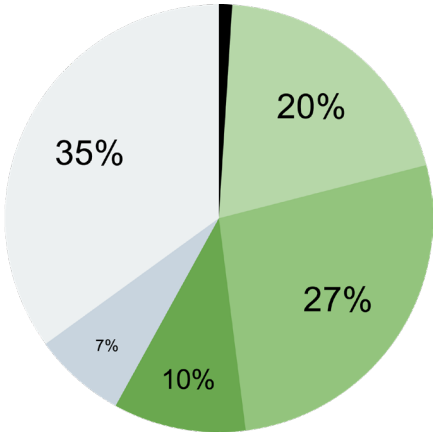
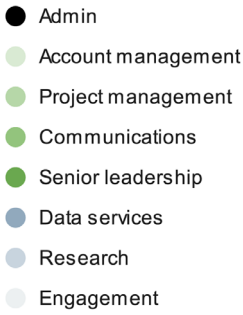
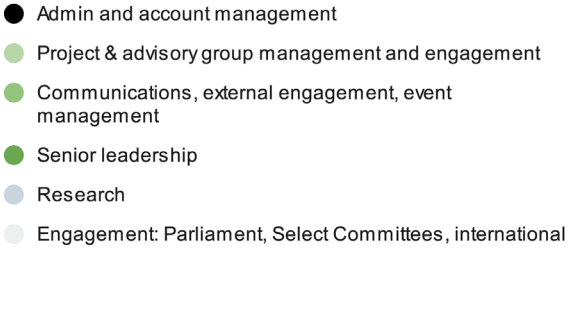
All reference documents, reports and updates are publicly available online at https://ib1.org/perseus with direct links included in the Appendix.

Government engagement

We report regularly to DESNZ and work with colleagues within the department, including the international teams on a weekly/fortnightly basis.

Icebreaker One sits on, and co-chairs, the national Smart Data Council. B4NZ also convenes the SME Advisory Group for the Transition Plan Taskforce, is co-convening the finance group of the National Retrofit Hub and is working to cement how Perseus fits into the Energy Efficiency Task Force and the Net Zero Council. Further, B4NZ is working closely with the SME Crown Representative in the Cabinet Office and its team in charge of government procurement to ensure that there is alignment. There are active conversations with HM Treasury, the Department of Business and Trade (DBT) and Defra.

Spend allocation

Breakdown of IB1 costs	Breakdown of B4NZ costs
	
	

Risk register

Code	Area	Risk description	Impact(s)	Current controls	Movement in risk since previous assessment	Likelihood	Impact	Risk score (1-35)	Target ('max acceptable')	Responsibility	Review action(s) & timeline
1	**Political**	Changes in government	Change in political support	Continued cross-party engagement and briefings to onboard new roles as they change	Increased	Possible	Minor	10	14	B4NZ	monitor
2	**Political**	Changes in policy against assurable, regulated reporting	Deprioritisation of Net Zero	Clear business cases; engagement with private sector; identification political support	Stable	Remote	Moderate	9	14	SG, AG1	monitor
3	**Political**	Lack of commercial engagement	Reduced sector feeback for requirements and implementation, reduced funds and subsequently the capacity to deliver on time	Clear business cases; engagement with private sector; communications	Stable	Unlikely	Catastrophic	20	25	SG, IB1, B4NZ	review 2024-01
4	**Policy**	Policy blockers to implementation	Delays for delivery	Propose changes to codes/regulations and/or adapt scope	Stable	Possible	Moderate	15	20	SG, AG5, AG3	review 2023-12
5	**Governance**	Lack of clarity undermines trust	Diminishment of trust	Clear publication of budgets; structures; processes; transparent and open communication	Stable	Remote	Major	12	14	SG, IB1, B4NZ	review 2023-12
6	**Financial**	Insufficient funds raised	Slower development	Adaptation of scope; fundraising	Stable	Possible	Moderate	15	20	SG, IB1, B4NZ	review 2024-01
7	**Operational**	Lack of time & resources from/with partners	Increase in costs; slowing of momentum; delays for delivery	Focus on subset of stakeholders to minimise complexity and cost; increased delivery from existing partners; harness advisory group participant contributions	Stable	Possible	Major	20	25	SG, IB1, B4NZ, Members	review 2024-01
8	**Communications**	Misalignment leads to confusion and disengagement	Lack of cohesion between activities, stakeholders and messaging	Clarity of mission, purpose and progress communicated clearly, addressed by outputs from AG4 Comms	Decreased	Remote	Moderate	9	14	SG, AG4	review 2023-12
9	**Communications**	Negative reception in market	Slower market engagement; confusion	Clear communication and expectation management via SG leaders with their members, and commercial partners with clients; refine AG4 Comms outputs to target pain points identified	Stable	Possible	Major	20	25	SG, IB1, B4NZ, Members	review 2024-01
10	**Communications**	Negative reception in media	Reputational impact; slower long-term engagement	Clear communication and expectation management via comms teams; refine AG4 Comms outputs to target pain points identified	Stable	Possible	Major	20	25	SG, IB1, B4NZ, Members	review 2024-01
11	**Communications**	No budget to attend COP	Reduced comms and engagement impact	Close funding or provide assets to those already going (e.g. UK Pavillion)	Decreased	Possible	Moderate	15	15	SG, IB1, B4NZ, Members	resolved
12	**Technical**	Technical blockers to implementation	Delays for delivery	Review scope and/or approach variation possibilities	Stable	Possible	Moderate	15	20	SG, AG2	review 2023-12
13	**Operational**	Stakeholder readiness and maturity varies	Lack of understanding, lack of engagement	We have identified clear business cases to understand in detail where problems occur and we will continue to work directly with stakeholders via advisory groups to understand pain points and how we can support resolving these. We would also support dialogue with regulators to recommend approaches for incentivising change in the industry.	Stable	Possible	Moderate	15	20	SG, IB1, B4NZ	review 2024-01
14	**Operational**	Outputs do not meet stakeholder needs	Reduction in market engagement, confusion	The advisory groups will seek continous feedback from stakeholders and recommend course corrections if needed	Stable	Possible	Major	20	20	SG, IB1, B4NZ	review 2024-01
15								0	14		

Minor < 7	Acceptable
Moderate < 17	At risk
Major > 18	

*R=Impact*Likelihood+(2xImpact)*

14. Appendix

Understanding the links between the real and financial economies

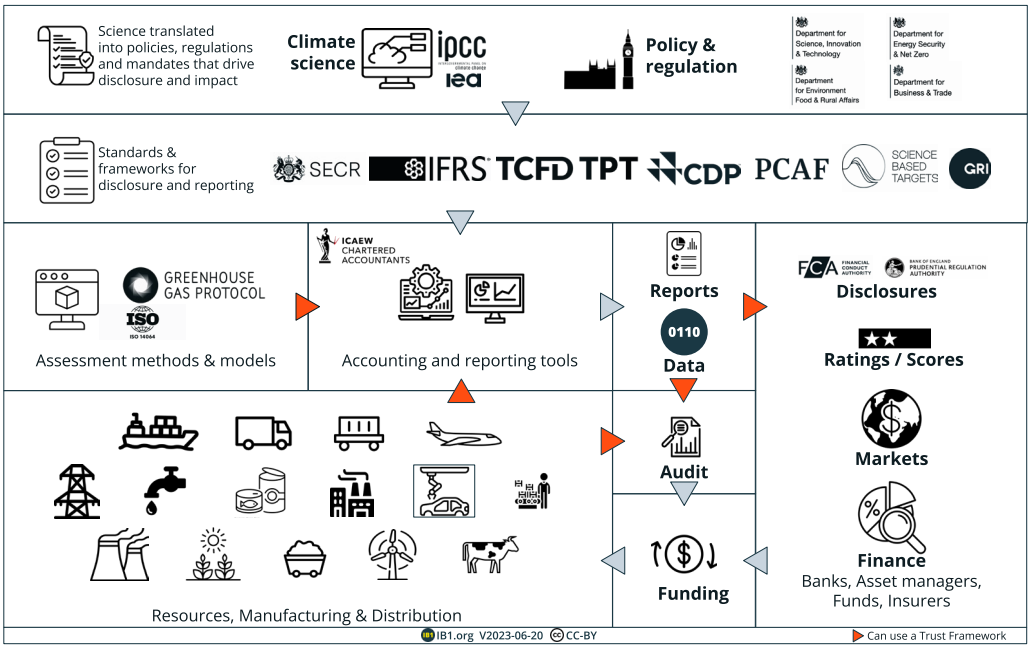
A broad range of organisations and initiatives are working, worldwide on net zero across climate, environment and finance. It is an emergent space, with many organisations assuming multiple and sometimes overlapping roles.

These include:

- Bodies defining climate science and recommendations (e.g. IPCC).
- Standards bodies defining global standards (e.g. ISSB).
- Bodies defining frameworks for reporting (e.g. PCAF).
- Sustainability reporting and disclosure organisations (e.g. CDP).
- Bodies defining methodologies for calculation (e.g. GHG-Protocol).
- Policy and regulatory organisations (e.g. FCA, PRA).
- Environmental data and technology organisations (e.g. NZDPU).

Here, we illustrate (at a high-level) how this landscape connects with organisations in the real economy who have to supply broadly, 'consumption data' to reporting tools that are, in turn, reported back to the financial economy. The financial economy then assesses, scores and makes recommendations related to investment.

Perseus: mapping reporting data flows across the whole ecosystem



Organisations across this ecosystem can use a Trust Framework to share data at market-wide scale. In 2023, Perseus demonstrated that this is achievable.

What is GHG Scope 3 Category 15 and how is it relevant to PCAF?

GHG Scope 3 Category 15 refers to a specific category within the Scope 3 emissions framework. It is designed primarily for private financial institutions, but it is also relevant to public financial institutions and other entities with investments not included in Scope 1 and Scope 2. Category 15 focuses on accounting for the emissions associated with investments made by a company. When the Scope 3 emissions from these investments are significant compared to other sources of emissions, investors should include them in their calculations.

The Partnership for Carbon Accounting Financials (PCAF) is a global partnership of financial institutions that work together to develop and implement a harmonised approach to assess and disclose the GHG emissions associated with their loans and investments. The PCAF methodology is based on the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard, which includes Category 15 for financial institutions to account for their investments' emissions.

Therefore, the guidance provided on measuring and reporting Scope 3 Category 15 emissions is relevant to financial institutions that are members of the PCAF and are committed to measuring and disclosing the carbon footprint of their investments.

Reference: https://ghgprotocol.org/sites/default/files/2022-12/Chapter15.pdf

Background and founding parameters

The Climate Change Committee estimates[28], that from 2030, an additional £50 billion/year of investment is required to achieve net zero. Perseus aims to help unlock that investment for UK SMEs in the race to net zero with **verifiable** impact.

B4NZ has worked on its SME workstream for over three years. It produced a scoping exercise in 2022 with The Smart Data Foundry, based out of the University of Edinburgh. A core recommendation for this project was a pilot programme — now Perseus. After roundtables with members, government and relevant stakeholders, including several carbon calculator firms, it was clear that the core element to be addressed, in the first instance, is the accuracy of data and the ability to assure that data.

1. Access to the data people need to make decisions is often not shared, doesn't exist or is shared in ways that are not fit for purpose[29] or in a manner that does not scale or can be trusted.[30]

2. There are material risks and threats to non-financial reporting, including that data is not matched to the user-needs of financial decision-makers[31] and that the lack of demonstrable, traceable and provable impact may represent a systemic threat to the development of 'sustainable finance.'

The decision process – which included extensive stakeholder engagement from government, banks and other parts of the private sector, therefore, narrowed the parameters of the next steps.

28 https://www.theccc.org.uk/wp-content/uploads/2020/12/The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero.pdf
29 https://viewpoints.reedsmith.com//post/102gj4u/is-data-broking-broke-unpicking-the-ico-s-recent-investigation
30 https://nic.org.uk/app/uploads/Data-for-the-Public-Good-NIC-Report.pdf
31 Via interviews with asset managers, insurers, banks and large corporate CSR leadership,

The core requirements at this pre-competitive stage included:

- The convening parties to be not-for-profit
- Convening a complex multi-stakeholder community.
- Outputs to be open, resulting in no one company or stakeholder owning the IP; which is to be used for the public good and accessible by all of the market.
- Unlocking data flow across systems, not 'building a database.'
- Ensuring consistency with the national data strategy.
- The ability to become part of the Green Finance Strategy, which Perseus now is.
- Fixing a time-to-market and scalability of the outcomes.

Likewise, government support is predicated on having a credible, not-for-profit platform that does not pick any one commercial actor. With the priority on creating the rails for scalable, assurable data flow, the Open Banking model of data sharing was identified. Icebreaker One, whose team co-designed Open Banking and created Open Energy, is the *only not-for-profit in the market* that delivers this. In addition, its team's previous experience means that the delivery cost is a fraction of attempting to get a private institution to recreate what has already been done.

Carbon reporting recommendations for broader development

We identified five recommendations for carbon reporting that would build trust, improve efficiency and support scale.

1. Organisations must produce discoverable and usable digital reports of their transition to net zero

To coordinate a transition to net zero and attract impact investment, organisations, and SMEs in particular, must digitally report and share their disclosure methods and results. This includes adopting a standard digital (non-pdf, non-xls) reporting and methodology framework, as well as the necessary operational infrastructure required to generate detailed, accurate, trustworthy reports.

2. Organisations must publish the data behind reports in machine-readable formats

All organisations that publish reports should publish the datasets and models used to generate these reports. The level of detail provided needs to be sufficient to enable stakeholders to analyse and act on data confidently. Publication in machine-readable, standard formats for data reporting will accelerate data uptake. Similarly, adopting standards for metadata (structured information describing the data) makes the data easier to find, assess and act upon. Metadata is also key to understanding data provenance, which is covered in our fourth recommendation.

3. The granularity of data in reports must be improved

There is a lack of data granularity and, therefore, comparability in reporting. Access to more granular data means investors can more accurately assess the performance and energy consumption of their assets. This would also enable better attribution and coordination throughout supply chains and could save investors money, while ensuring they're aligned with reporting standards. The more granular the data, the more likely the organisation is to attract impact investment and gain trust. Organisations at the top of the supply chain should take responsibility to define the environmental data granularity.

4. Organisations must demand data-backed standardised reports from their supply chains

Whilst currently not a mandatory TCFD reporting requirement, the demand to demystify supply chain emissions data will only grow to meet the higher expectations from consumers, investors and employees who require assurance that the emissions from the entire supply chain are accounted for. To achieve this at scale, there is an urgent need to agree rules and standards for representing data provenance, so that it can flow alongside the data from company to company up the supply chain. A fundamental requirement for provenance is for reporting organisations to be identified within a trusted data ecosystem.

5. Regulators and reporting bodies must mandate a trusted data-sharing ecosystem

Removing barriers to access climate risk data, for instance, would create a more even playing field for firms bidding for contracts. We discovered through our research that environmental risk data is often not available until after a contract has been won: data is not public and often can only be accessed once an organisation has won a contract. A Trust Framework - a governance and technical ecosystem that controls what data may be used by which types of organisations for what purposes - would enable data to be published more confidently and mobilised more freely to unlock investment. Sectorial support and collaboration is required to design and implement a Trust Framework that addresses the needs of investors.

Scope for 2023

SBTi, PPN 06/21 Carbon Reduction Plans and all other GHG reporting standards are based on the GHG Protocol. In this initial context, we are concerned with Scope 2 emissions, which the GHG Protocol allows to be calculated using two methodologies: location-based and market-based. (Note: if market-based is used, location-based must also be reported).

With the addition of good quality, publicly-available data, the initial scope has enough information to calculate emissions using the location-based methodology to a higher resolution than current standard practice. With the addition of currently available data, market-based calculations can also be performed, although not yet to a similar resolution (until half-hourly generation data is included) and subject to the current flaws in the UK electricity market (specifically unbundled REGOs[32]).

It was proposed in discussion that a market-based approach requires additional data, which is difficult to access and may be a barrier to SMEs reporting (e.g. Renewable Energy Certificates purchased, Power Purchase Agreements, etc.). Consequently, it was decided that consideration should be given to whether market-based calculations are necessary for the pilot and, if so, how the additional data will be gathered to make these calculations possible. One suggestion would be to provide energy supplier names, so that carbon calculators can generate and apply supplier-specific emissions factors or, alternatively, provide a set of open source supplier-specific emissions factors.

Based on this, additional research was undertaken into data requirements and availability. A subgroup comprising metering, supplier and DNO representatives was convened and these issues have been progressed. Half-hourly demand data per MPAN is readily available, as is tariff data. Half-hourly generation data may be more problematic, but will be critical for decarbonisation. Perseus is, therefore, focussing on half-hourly consumption data.

SmartDCC can return address data, given an MPAN. It is not yet clear whether it can do the reverse, so that MPANs can be looked up, using only address data. This can be done in a piecemeal fashion already, using individual electricity supplier websites (the MPAN is printed on every electricity bill), but it is not yet clear whether it can be done automatically across the whole market. If this functionality is required, this will need to be resolved. In the 2023 scope the unique identifier will be the MPAN.

What data is necessary? (current position and priorities are in **bold**)

32 https://www.ofgem.gov.uk/environmental-and-social-schemes/renewable-energy-guarantees-origin-rego

- Electricity consumption:
  - Time resolution (**half hourly**, hourly, less frequent)
  - Spatial resolution (Group, company, **MPAN**, circuit)
- Grid carbon intensity
  - Spatial resolution (country, region, **DNO**, primary station)
  - Forecast or **historical** only
- Generation:
  - **Single DNO regional grid area**
  - Pass through (green tariff)
  - Adjustment of grid carbon intensity to compensate for demand taken out by green tariffs
  - Generation data source:
    - Is data from large generators sufficient?
    - Is settlement data lag a problem?
- Tariff (pricing) information
  - Useful for Return on Investment (ROI) calculation
  - Useful for ROI on decarb solutions, can be provided by DCC
  - Useful for avoiding calculation errors when discounting spend from SME transaction/accounting data
  - Helps build the business case for reduction actions, which is the primary adoption driver for SMEs

For 2023 scope, communication of MPAN and half-hourly (HH) demand is sufficient (with date/time from and to). SmartDCC has confirmed that this data is available:

- Site address
- Tariff
- Dumb meter demand
- Supplier ID
- Generator carbon intensity from mandatory Fuel Mix Disclosure (this is an averaged annual figure, including unbundled REGOs)

Additionally, HH resolution grid carbon intensity is available from National Grid ESO (Carbon Intensity) for historical and 48-hour forecasts.

Matrix of use cases and data requirements

	Banks	Data Providers	Carbon accounting
MPAN		✓	✓
Address	✓	✓	
Supplier ID	✓	✓	✓
Annual Fuel Mix	✓	✓	
Tariff	✓	✓	✓
DNO grid carbon intensity	✓	✓	✓
HH demand kWh	✓	✓	✓
Dumb meter data	✓	✓	✓
Half-hourly generation kWh		✓	✓

Improvement of financial and impact risk

Banks have stated that high risk is hampering their efforts to lend to green projects. This risk includes financial risk (common to any loan) and impact risk (the risk of their loan not having the environmental benefits they want).

Specifically, the credibility of GHG reporting means that the risk profile of green lending is high. Provision of better, verifiable and assurable data will decrease that risk, leading to a decrease in the cost of capital (how much needs to be put aside in reserves) and enabling banks to increase credible green lending to the SME community.

Financial risk

Perseus can help banks to reduce financial risk by providing more accurate data in a loan application on:

- Energy use
- Energy cost
- The effectiveness of the intervention to be financed
- ROI

After the application, data can be used to demonstrate the actual, delivered benefits in terms of:

- Climate impact
- Financial benefit to customers

Impact risk

Banks currently assess the 'greenness' of loans by reference to a taxonomy. If a project is on the list (e.g. EV charging infrastructure, heat recovery equipment, photovoltaics, etc.), it is deemed 'green' and attracts whatever preferential rate the bank offers. There are two ways in which this system can be improved:

- The effectiveness of different interventions varies between applicants.
- The list is closed, preventing applications for other interventions, which may be effective (particularly in the specific context of individual applicants), but which are not included in the generic taxonomy.

Perseus will automate the provision of highly accurate impact and cost information, allowing banks to open applications to any intervention that can be demonstrated to deliver a positive climate impact, while yielding a sufficient return to support the loan.

Efficiency

There is consensus that even this initial phase will increase efficiency and begin the process of allowing the development of new financial instruments and other opportunities (e.g. lower friction, higher resolution automated carbon accounting) and that this will only be increased as the post-demonstrator roadmap progresses, bringing in additional data sources (e.g. tariff data, dumb meter readings, site address and Supplier ID, annual carbon intensity inc. REGOs; all from MPAN).

The priority for 2023 is to 'do one thing well' and to be as "simple as possible while demonstrating potential and delivering immediate value." Although the initial scope is a minimal demonstration of functionality, the aim of the project is maximum functionality: a race to the top.

Emissions calculation methodologies

The Greenhouse Gas Protocol recognises two calculation methodologies to estimate emissions from the use of electricity (Scope 2): location-based and market-based. If the market-based methodology is used, the Protocol requires that the location-based methodology is supplied as well. The Protocol is under revision, with most of the consultation responses being concerned with Scope 2 calculations, so this may change soon, but whatever changes are implemented, it is likely that these methodologies will be retained for consistency with historical reporting.

Use of the market-based methodology in the UK is undermined by the ability of renewable energy generators to 'unbundle' Renewable Energy Guarantees of Origin (REGOs) from generated electricity. This allows suppliers to purchase enough unbundled REGOs at the end of the year to make the electricity they have supplied to their customers appear renewable, when, in fact, any matching of renewable generation to customers' demand is coincidental. In other words, suppliers can purchase whatever wholesale electricity is available on the market to match demand when their customers need it, then buy unrelated REGOs at the end of the year, which relate to renewable electricity that may have been generated at any time.

The implication for emissions calculation methodologies is that the location-based method is sound, but the market-based method is not. Businesses that pay for a green tariff and then report zero emissions from electricity use, misrepresent their climate impact and prevent opportunities to reduce it. This is the sort of institutional greenwashing that reputable organisations, such as banks, must take care to avoid.

Given that the core use case for this platform is the calculation and communication of accurate carbon emissions estimates, it is critical that this issue is addressed and resolved by AG1.

The following section expands on this issue and proposes a route forward to be debated.

Location-based methodologies

Half-hourly (HH) resolution carbon intensity data is available[33] from the National Grid for each DNO (historical and two-day forecast). This can be aggregated to the whole of the UK or used at this resolution. There are arguments for both approaches:

- UK resolution data is commonly used, so this would be consistent with current practice (however, we are in a position to improve on current practice).
- DNO resolution data makes visible the huge differences in carbon intensity within DNO regions. This is caused because most renewable generation capacity is in Scotland, but most demand is in England, specifically in the South-East. As the transmission infrastructure is currently inadequate, generation is constrained even when demand in the South is high. This means that Scope 2 emissions from businesses in the North really are lower than those in the South. Additional demand results in reduced renewable generation constraint in the North, while in the South it results in additional fossil generation capacity coming online. The argument is that it would be an odd decision to discard good and useful data by averaging out these differences.
- It may be that the best approach is to do both: maintain current practice at a UK level and calculate location-based emissions at a regional level.

Perseus will provide HH demand data for each MPAN, allowing calculation of HH resolution location-based emissions at the DNO-level or at any lower temporal and spatial resolution.

33 Carbon Intensity API v2.0.0 – Carbon Intensity API (carbon-intensity.github.io)

Market-based methodologies

To generate market-based emissions that are accurate enough to be useful for decarbonisation, we need to know the HH fuel mix attributed to each tariff provided by each supplier (because suppliers may sell green and brown tariffs out of the same purchased wholesale electricity). The HH fuel mix per supplier would be acceptable, but would result in only one calculation being possible per supplier. This would undermine a suppliers' ability to sell green tariffs or, indeed, more than one tariff of any sort.

We currently have annual fuel mix per supplier, but this averages out time of demand across the year, making it of limited use for calculating the emissions associated with electricity use and no use for driving behaviour to reduce emissions. This is also reported inclusive of the purchase of unbundled REGOs, so it does not reflect actual emissions associated with electricity use. The HH fuel mix data per tariff is, therefore, considered a 'must have' for the roadmap. Without it, the market-based calculation methodology is unsound.

This is illustrated below. For November 2022, the following plots show:

(1) Half-hourly data for one of Sage's electricity meters.

(2) UK grid carbon intensity as a proxy for HH generation data from a supplier with a poor-quality, but entirely legal, green tariff.

(3) Calculated GHG emissions associated with electricity demand on this meter.

(4) Emissions reported using the market-based emissions calculation methodology, with a green tariff using unbundled REGOs.

This illustrates the variability in electricity demand and grid carbon intensity over a month, resulting in highly variable emissions. Averaging this variability out over an entire year loses this detail. It prevents businesses from targeting actions to decarbonise their electricity use and reduces the accuracy of emissions calculations for banks and other users.

Even though demand is relatively stable throughout the month, the variation in grid carbon intensity results in a highly variable emissions profile. With this information, businesses can modulate and time-shift demand; without it they cannot.

Finally, the difference between emissions calculated in (3) and (4) illustrates the effect of pretending that green tariffs using unbundled REGOs result in no emissions. This is one example of why this system is no longer fit for purpose. Another is that the calculation of residual grid carbon intensity is unaffected, when it should go up to compensate for retired REGOs.

Accurate calculation of emissions using the market-based methodology requires the emissions from generation (i.e. fuel mix) to be matched to demand at high resolution (i.e. half-hourly). To do this, half-hourly generation emissions data is required.

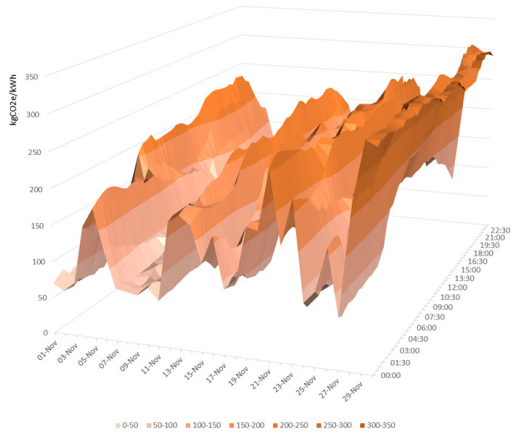


Figure 2

UK grid carbon intensity as a proxy for HH generation data from supplier with 'green tariff'

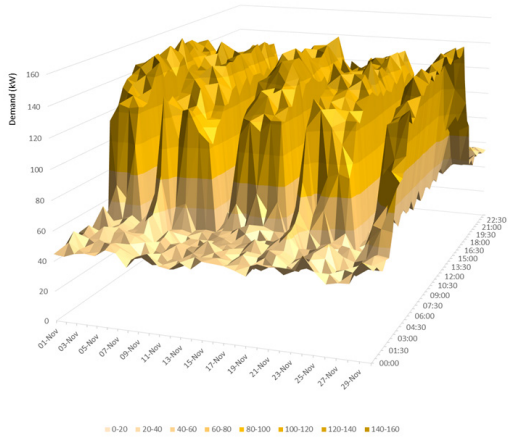


Figure 1

Half-hourly data from a smart electricity meter

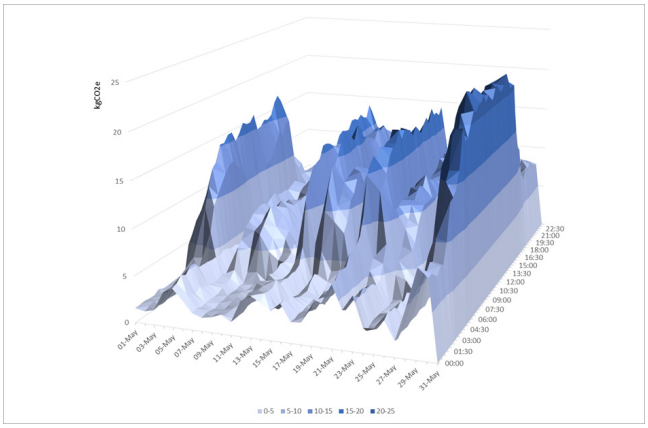
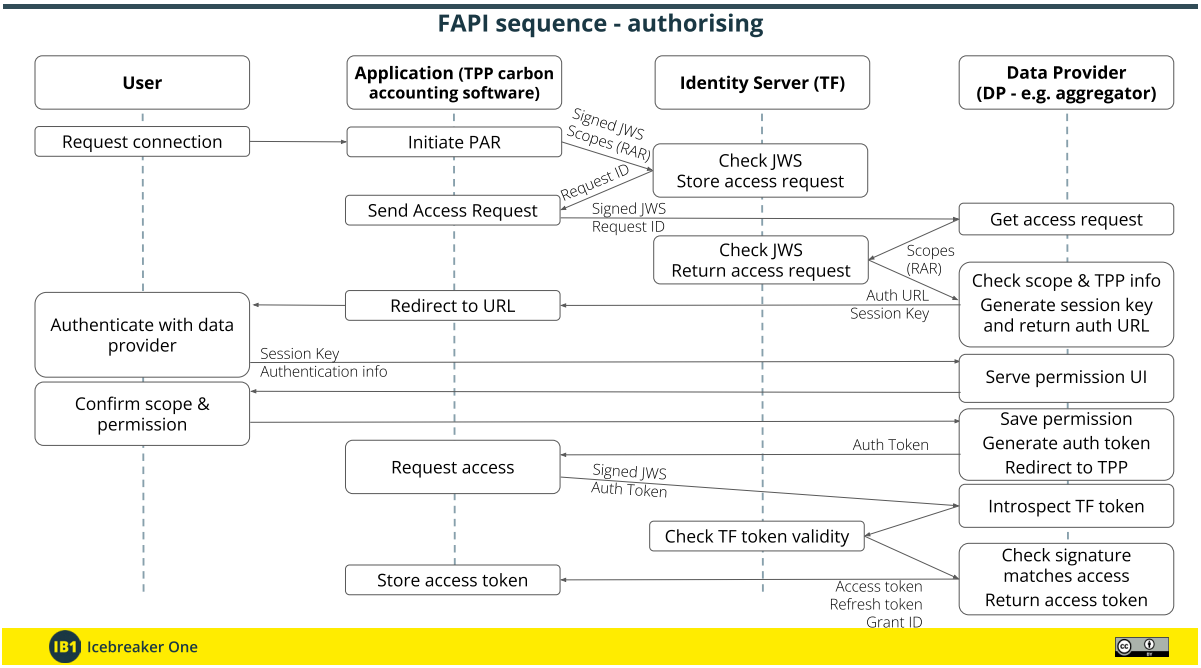


Figure 3

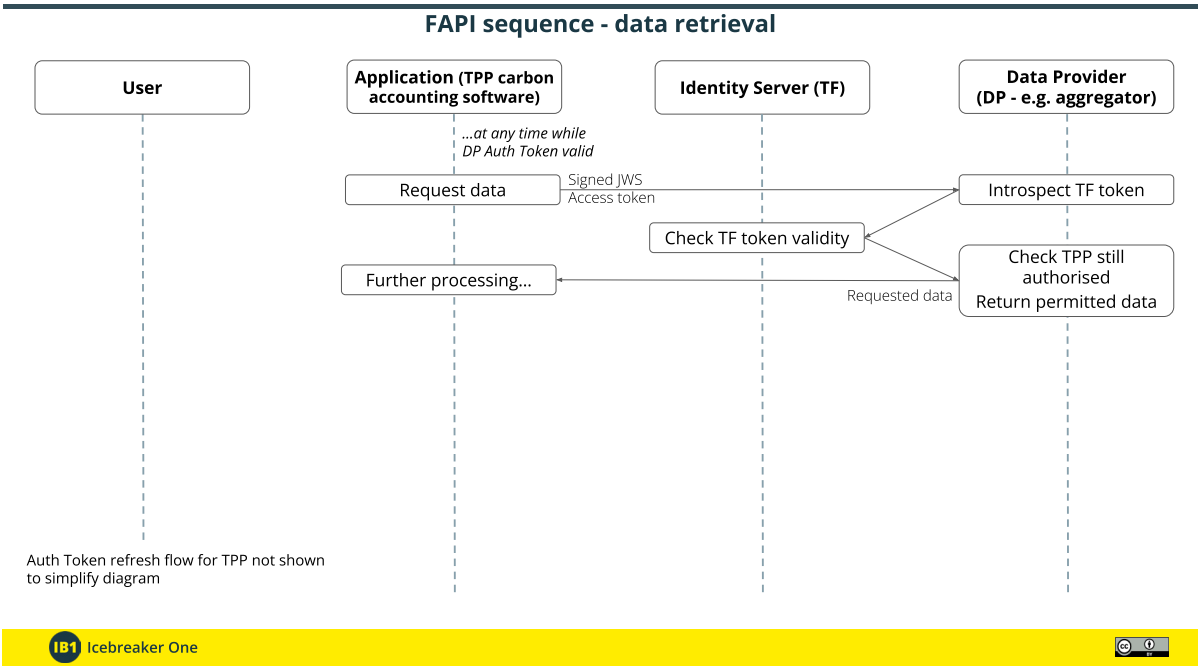
Calculated GHG emissions associated with electricity demand on this meter

FAPI permission and data flows

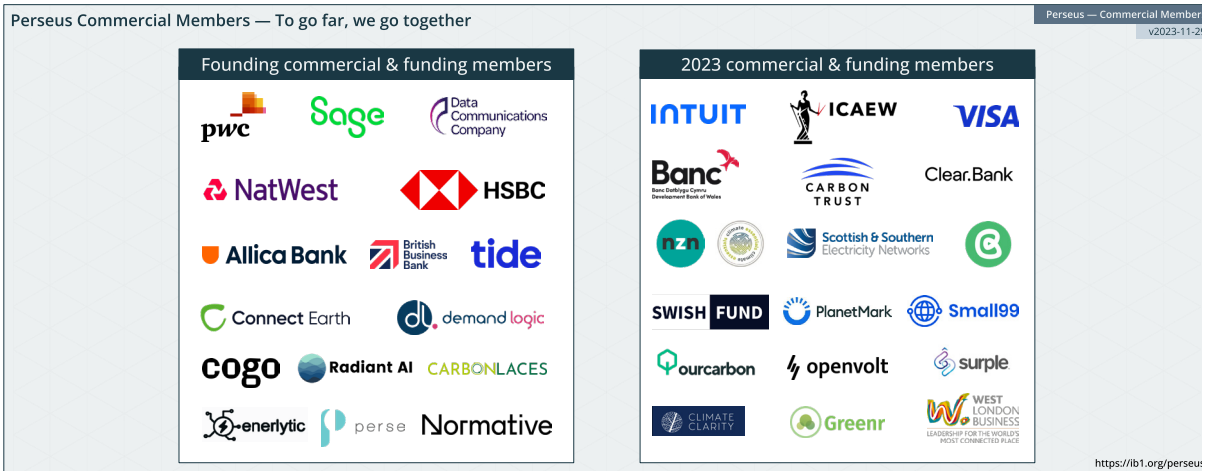
Permission



Data retrieval



Member and observer logos

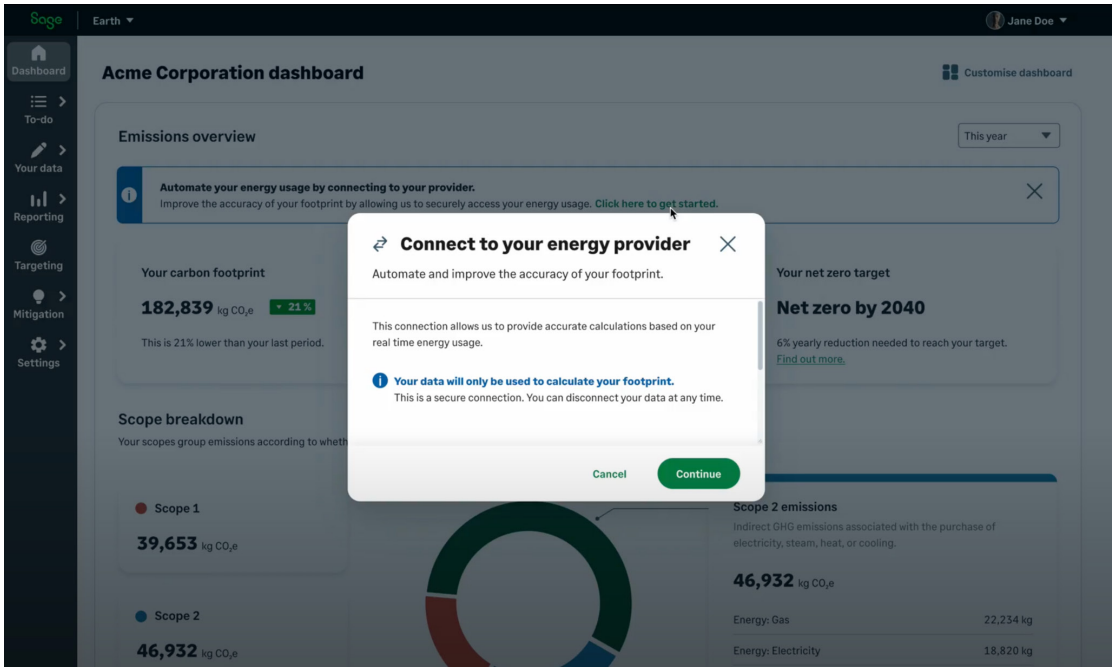


Examples of SME software applications

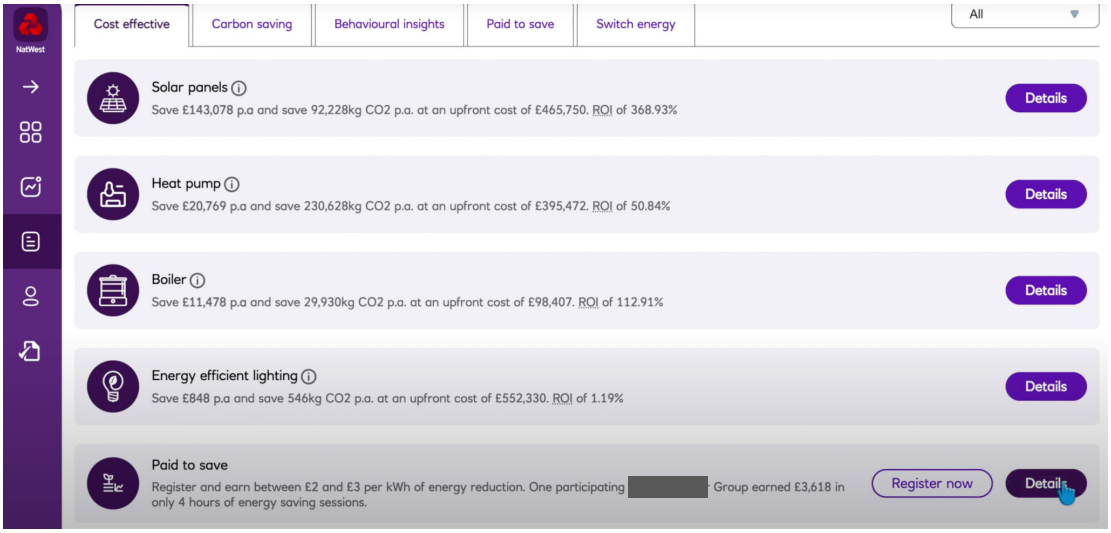
NB: inclusion of these examples does not represent endorsement of any specific commercial solution by the Perseus constellation.

Screenshots of various applications from Perseus commercial Members are included below to illustrate what SME applications look like today, the diversity and breadth of approaches, and the common need to simplify raw data acquisition.

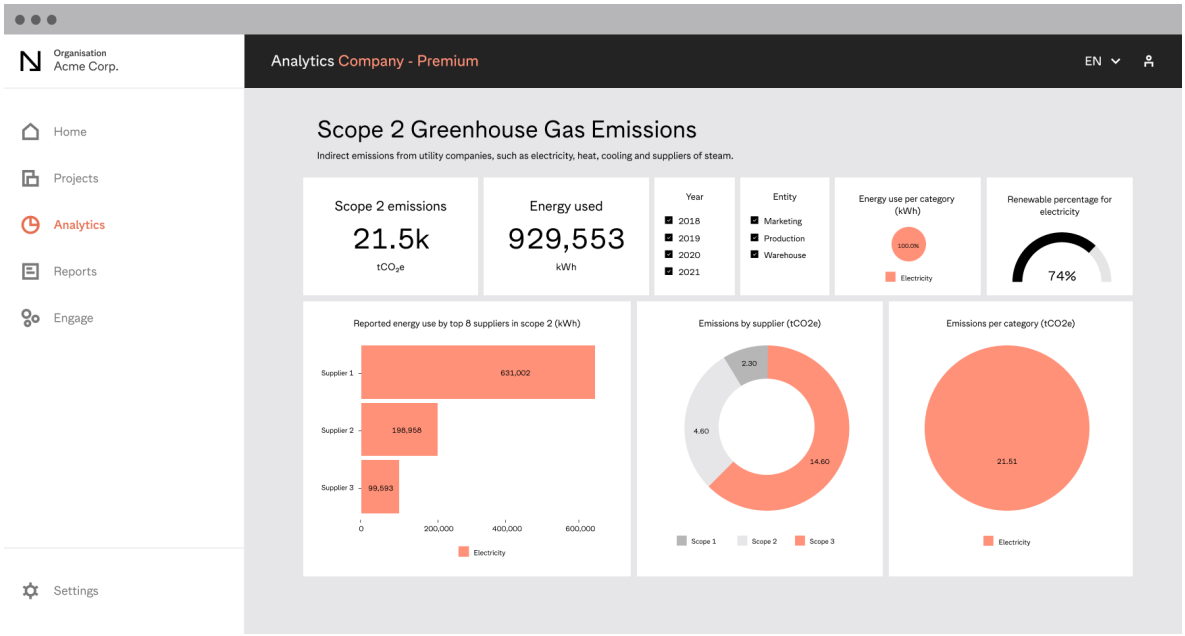
Sage Earth: demonstration of an application seeking permission to access smart meter data using the Perseus scheme to fuel its calculation, reporting and recommendation engine



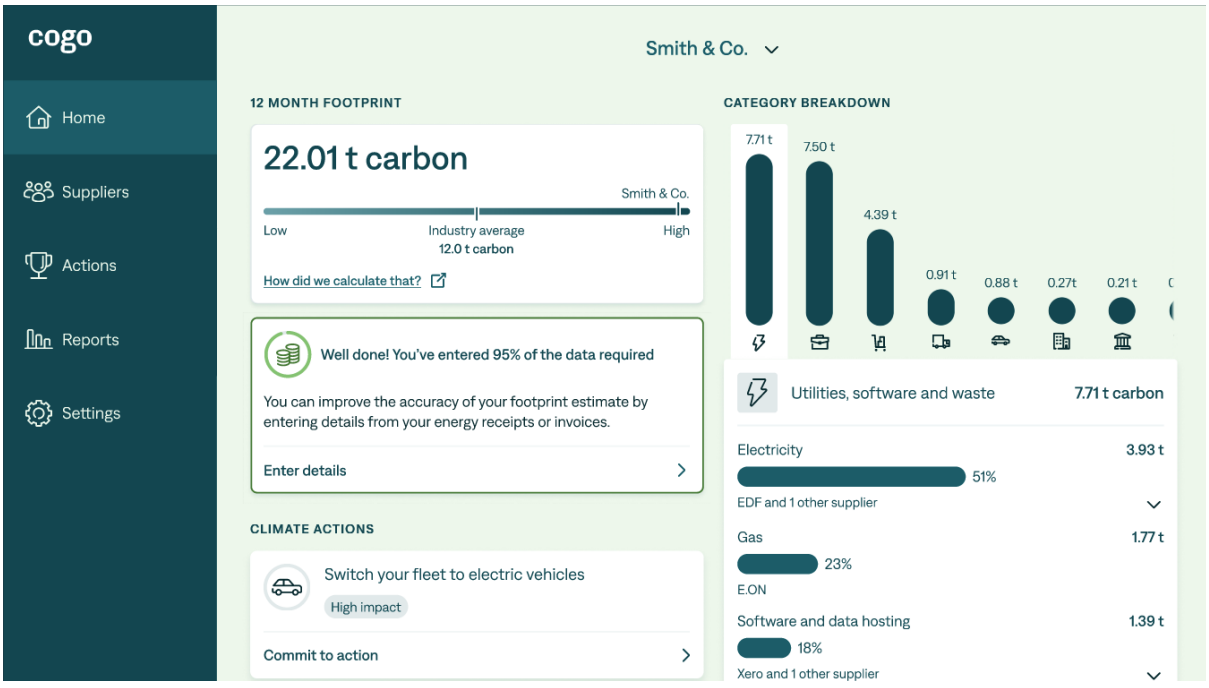
NatWest & perse: example of personalised recommendations derived from SME data



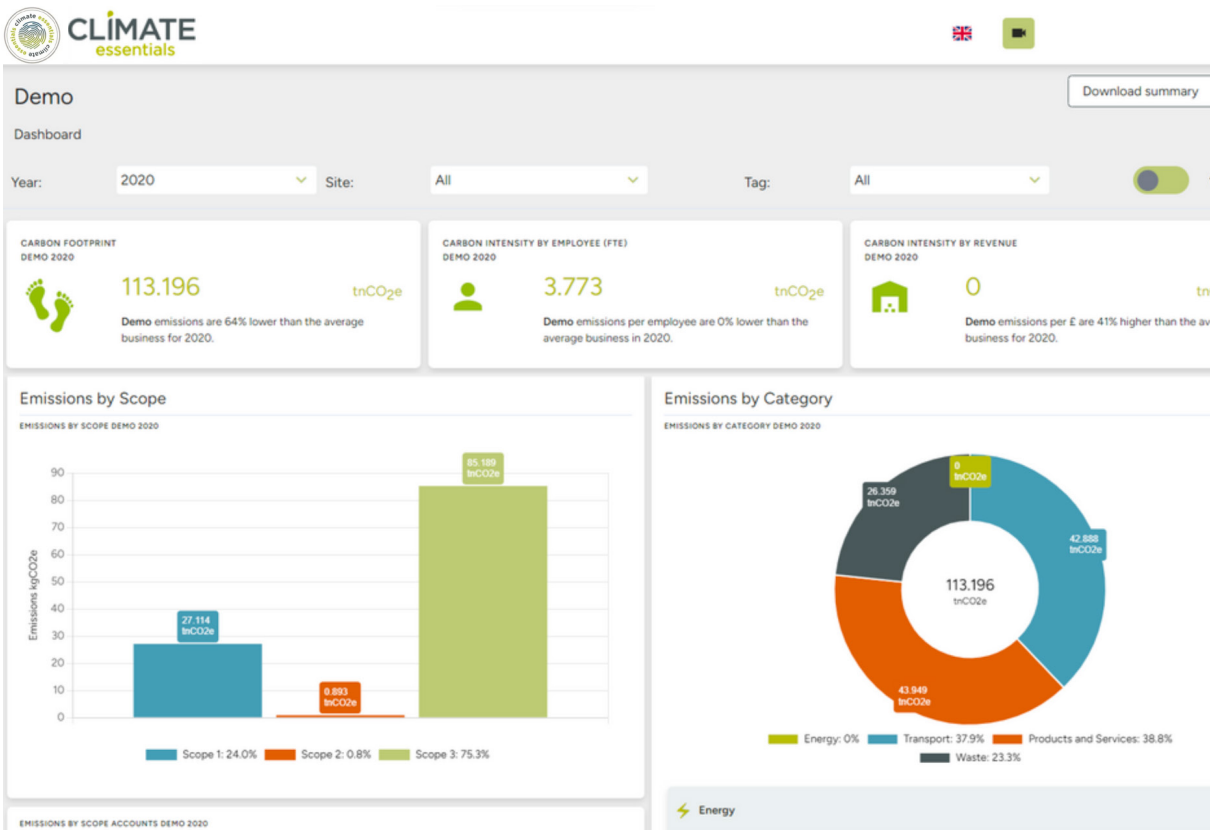
Normative: example of a Scope 2 GHG Emissions dashboard



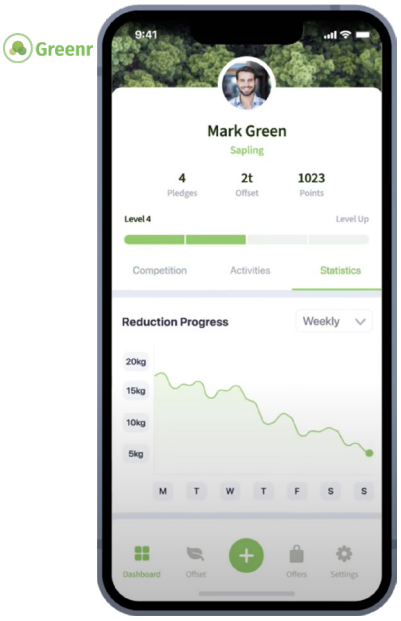
Cogo: example of an SME reporting dashboard



Climate Essentials: example of a climate emissions dashboard



Greenr — example of mobile application showing progress dashboard for an SME user



References

Public documents and references.

Project site

- https://ib1.org/perseus
- Updates: https://ib1.org/tag/perseus/ (including all meeting minutes)

2023 Terms of Reference

- Steering Group (PDF download v2023-02-03)
- Advisory Group (PDF download v2023-05-24)
- Standard procurement practices https://ib1.org/procurement
- Standard collaboration principles https://ib1.org/collaboration

Technical references

- Icebreaker One technical documentation
- Overview of Open Banking FAPI
- Technical introduction to FAPI
- Schema.org (definitions of common data entities)
- Trust Frameworks

Smart Data Consent and Liability framework

- Smart Data - liability
- Smart Data - consent
- Summary video and narrative on Smart Data

Market Architecture

- https://ib1.org/report-nfdf

Baseline Research (B4NZ)

- The Role of Banks in Reducing GHG Emissions of UK SMEs