



Emissions Management & Reporting

Measuring emissions across complex value chains



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In our last article, we identified the commercial logic of proactively accounting for carbon emissions across energy and natural resources value chains. Now we look at the practical issue of emissions measurement: how market participants are approaching this highly complex challenge today, and how the further development of good industry practice is needed if we are to achieve genuine transparency around emissions.

It starts so simply: just 3 scopes...

The starting point for any company seeking to report on their emissions is the approach set by the Greenhouse Gas Protocol, which defines three ‘scopes’.

Scope 1 emissions are directly from sources that your company controls or owns.

Scope 2 emissions are from the generation of purchased electricity used by your company.

Scope 3 covers all other indirect emissions across the value-chain of a product.

Since there are many indirect sources of emissions for any product, Scope 3 is broken down into 15 categories (see page 7).



For a simple manufacturing business operating in a relatively short and transparent value chain, the current guidance might suffice. Of course, energy and natural resources value chains are often long and opaque, and the activities of market participants may include any or all extraction, production, refining, generation, manufacturing, distribution and trading. As a result of this complexity and variability, there is no one-size-fits-all approach to emissions measurement that they can apply.

Applying this seemingly straightforward 3-scope framework to energy and natural resources value-chains – whether power, oil and gas, mining or commodity trading – is therefore an extremely complex undertaking that requires deep sector and emissions reporting expertise along with judgement, interpretation and strategic thinking at every step.

The unique conceptual framing of emissions measurement

In practice, this means the GHG Protocol isn't a prescriptive set of rules that can be applied automatically or arithmetically. There exists ambiguity and the scope for interpretation (or, quite often, misinterpretation!) at every stage.

For those executives used to the relative certainty of financial accounting, emissions measurement can be disorientating, especially where Scope 3 is concerned. There is rarely any doubt as to who 'owns' a certain dollar, but that's not the case when it comes to calculating emissions. As a result, as each company works through which emissions seem relevant and material to them, conversations can quickly become semi-philosophical.

Without hard-and-fast rules or the inherent discipline of something like cashflow accounting, when it comes to emissions, decision-makers can feel trapped between the competing business drivers of long-term sustainable strategies and short-term commercial considerations.

Then there are practical difficulties: such as the availability of data relating to emissions across a value chain. And on top of this, whatever you decide makes sense to measure and report on might not be what regulators and other external stakeholders demand – and different regulators will ask for different data on the same activities, and the same data in different ways.

Perhaps the greatest departure from traditional accounting is the fact that double-counting is built into the GHG Protocol as an intended outcome. From a certain perspective, double-counting is the whole point – it is a way of asking every participant to take at least partial responsibility for every contribution to global warming that they benefit from and have some influence over.

For a producer, this challenging concept is at least somewhat tangible. But for a trading organisation that can switch from product-to-product at the move of a mouse, the moral weight of responsibility for a particular commodity's emissions can feel ephemeral. Such intuitions can lead to measurement criteria being set that make little sense in terms of the ultimate goals of carbon emissions transparency and real-world reduction.

The good news is that, through our work with major producers and traders in energy, mining and metals and oil and gas, for every conundrum posed by the GHG protocol, we have found pragmatic solutions and principles to guide clients through the labyrinth of decisions they face, to achieve a methodology that is meaningful and strategically sound.

Let us give you an idea of some of the more common conundrums that energy and resources players face when working out which emissions to measure.

“We have found pragmatic solutions to guide through a labyrinth of emissions measurement decisions ”

What constitutes ‘your’ assets?

At first glance, Scopes 1 and 2 seem conceptually straightforward and could simply require a ‘totting up’ of emissions from your various operations according to the manual. But since no such manual exists, fundamental strategic – even philosophical – questions immediately arise.

For instance, in the complex web of asset ownership and usage, what constitutes your assets? Is it those you have operational control over, or also those assets of which your organisation owns an equity share?

For many organisations, taking a pure operational-control approach will leave out significant proportions of their business and assets over which they exercise some influence.

Taking account of equity share provides a more accurate reflection of things. For some assets, taking a share of emissions in proportion to equity ownership might make sense. But the situation on-the-ground (or under-the-ocean) tends to be more complex.

To take the North Sea as an example, and the spider’s web of operational and ownership inter-connectivity from its hundreds of platforms and 22,000 miles of pipelines. To follow a molecule through this infrastructure would take you

from well, to pump, to compression station, to gathering station and onto delivery. How can you know what proportion of a central hub’s emissions you should adopt? Calculating your proportion of an installation’s emissions using a ratio of your proportion of its total flow per day would seem a plausible solution... but nowhere is this ‘written’ – it’s a decision you will have to make internally.

What if you own that central station but don’t pump any oil through it – what then would be your share of such a ‘normally unmanned installation’?

In reality, ‘operational control’ and ‘equity-share’ models are stylised concepts and, to some degree, both will need to feature as part of a fully integrated emissions-measurement framework.

When assessing your options, it is helpful to establish a principle that you can refer to consistently, so you don’t get overwhelmed with each micro-decision. One such principle is that of ‘what can you influence’. After all, you can only take responsibility for something that you have influence over. If we all pull in the same direction and towards the same goals, this inherent subjectivity should not prove too great an obstacle.

To paraphrase a sentiment recently expressed by the head of one of the largest oil majors, just as we account for the profit from every barrel, we want to account for the emissions from every barrel.



All along the value chain, upstream and down

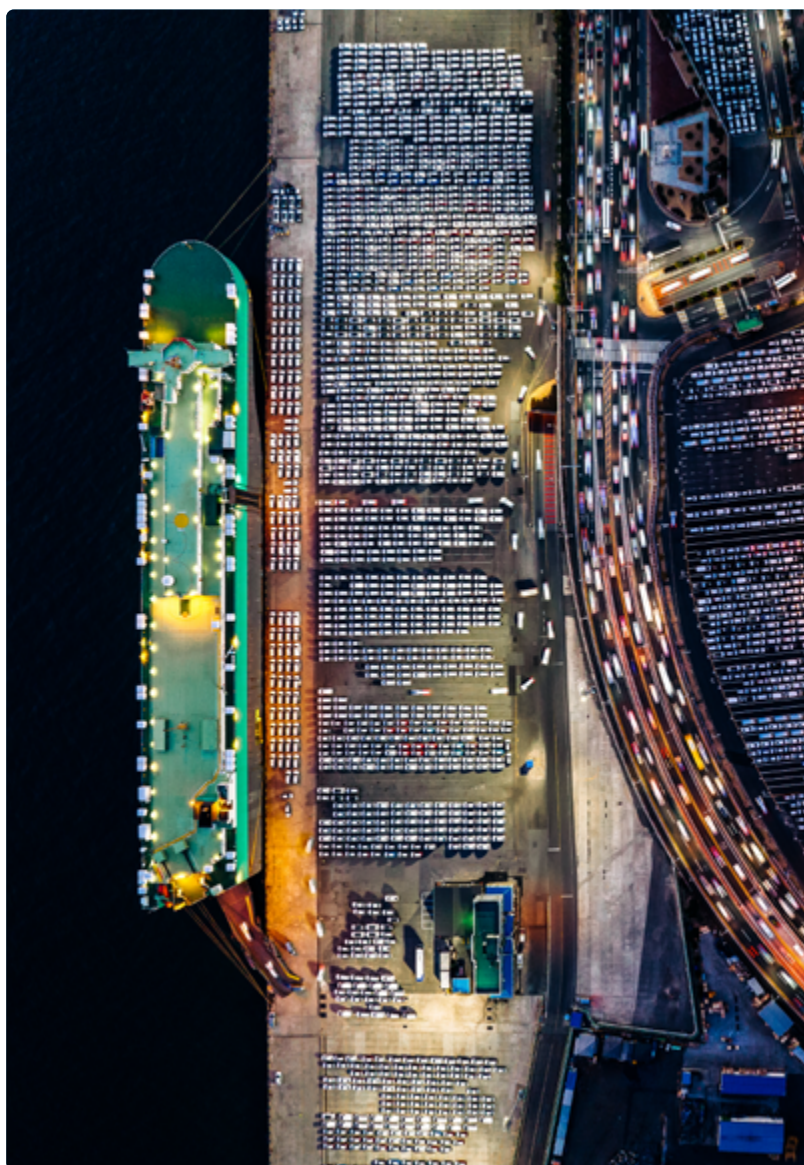
So, you have cracked Scope 1 and 2, you must be two-thirds of the way there, right? Unfortunately not. The most difficult and time-consuming part is yet to come. The task of identifying and tracking emissions across the value chain of a commodity, from extraction to end product, is orders of magnitude more complex.

As a result, some companies are effectively choosing to ignore most of Scope 3's categories, perhaps in the belief that calculations on such a distributed scale are simply 'Mission Impossible'. To quote from that movie, 'Relax, it's much worse than you think'.

Consider that the value chain of many commodities are effectively open-ended, as they are traded and re-traded, fashioned into an 'end-product', which turns out to be just a component in another end-product, which is then recycled into another 'end-product'... While double counting is within the conceptual framework of the GHG Protocol, the potential for multiple boundary overlaps among different participants could lead to absurd levels of duplication.

Even once sensible boundaries have been defined, actual measurement will be dependent on the availability of data, for which you will be, by definition, reliant on third parties. And then there are the methodological decisions around how to estimate emissions, either from recalcitrant suppliers or sources of emissions where precise readings are impractical.

Against such challenges, skipping over most of Scope 3 may seem like the lowest risk option. Just a brief glance at the changing political and regulatory environment will hopefully be enough to disabuse anyone of this notion. Perhaps more importantly, ignoring material categories will also fail to accurately reflect an organisation's



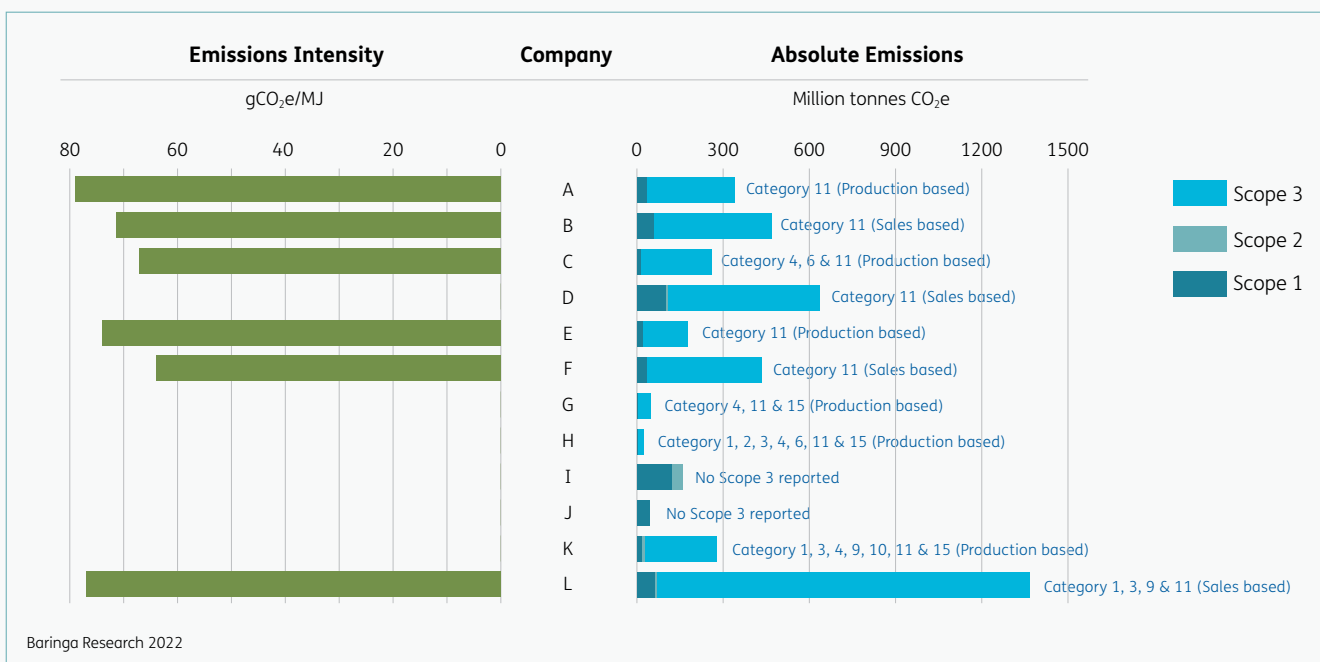
role in carbon emissions. Scope 3 emissions are very often the largest source of emissions, on average more than 11x greater than Scope 1 and 2. It follows that such value-chain emissions offer the greatest opportunity for reduction. Furthermore, as we outlined in our previous article, understanding upstream and downstream value-chain emissions presents opportunities to gain significant competitive advantage.

Before we consider how to go about this, let's look at some current practice.

Benchmarking Scope 3 approaches in oil & gas

To understand the extent of discrepancy among comparable market participants when it comes to Scope 3 reporting, Baringa undertook a benchmarking exercise of 12 of the world’s largest oil producers and traders.

Our results suggest that taking today’s corporate reporting of Scope 3 emissions at face-value (and it is very difficult to do otherwise without undertaking extensive research) is largely meaningless. For instance, two oil majors with comparable businesses, activities and, in all likelihood therefore, emissions, differ in their Scope 3 reporting by about a billion tonnes of CO₂).



This colossal discrepancy isn’t, as you might expect, simply a result of one company reporting more categories. In fact, in this case, it is the difference in boundaries applied to the calculation of Category 11 that leads to such wildly differing outcomes.

The first of these oil majors simply multiplies its crude production by an emissions factor. Proponents of such an approach would argue that it ensures everyone takes responsibility for their own crude production, so that everything is covered with no double-counting.

Meanwhile, its counterpart calculates sales of combustible refined products – including those they refine from their own and third-party crude, and some products that they buy and sell. This adheres to the philosophy that double-counting is a feature not a bug – if we all take shared responsibility, we are more likely to manage the problem together.

In between these two extremes are a plethora of approaches, where sales of refined products are often taken as the basis of the calculation, but with certain types of trade and counterparty excluded.

Some US oil majors included in our benchmarking, despite publishing three separate Cat 11 estimates, reveal so little about their methodology or boundaries that are the basis of the calculation – and therefore the context of their emissions – remains highly opaque.

Meanwhile, there are 14 other categories being ignored by the vast majority of players. These include material categories that are very much within their control, such as transportation. While category 11's use (combustion) of sold products is by far the largest emitter for the sector, in absolute terms the other categories are still very large emitters. As a result, the oil sector's Scope 3 reporting track record is somewhat chequered (see below). For the avoidance of doubt, all the companies in the sample claim to comply with the letter of the GHG Protocol.

	Co. 1	Co. 2	Co. 3	Co. 4	Co. 5	Co. 6	Co. 7	Co. 8	Co. 9
BOUNDARY DEFINITIONS									
Production based equity share	11							11	
Production based operational control			11		11	11			
Sales based for end use only					11				
Sales based some exclusions		11							
Multiple production, throughput & sales							11		11
All relevant products/services procured			3 4 6					4	
Spend based Opex			1						
Spend based Capex									
3rd party gas, crude, refined and biofuels		1							
3rd party energy for re-sale some excluded		3							
Sold own oil, LNG, GTL, gas & biofuels		9							
Investments Scope 1 & 2				15					
Investments Scope 1, 2 & 3			15						

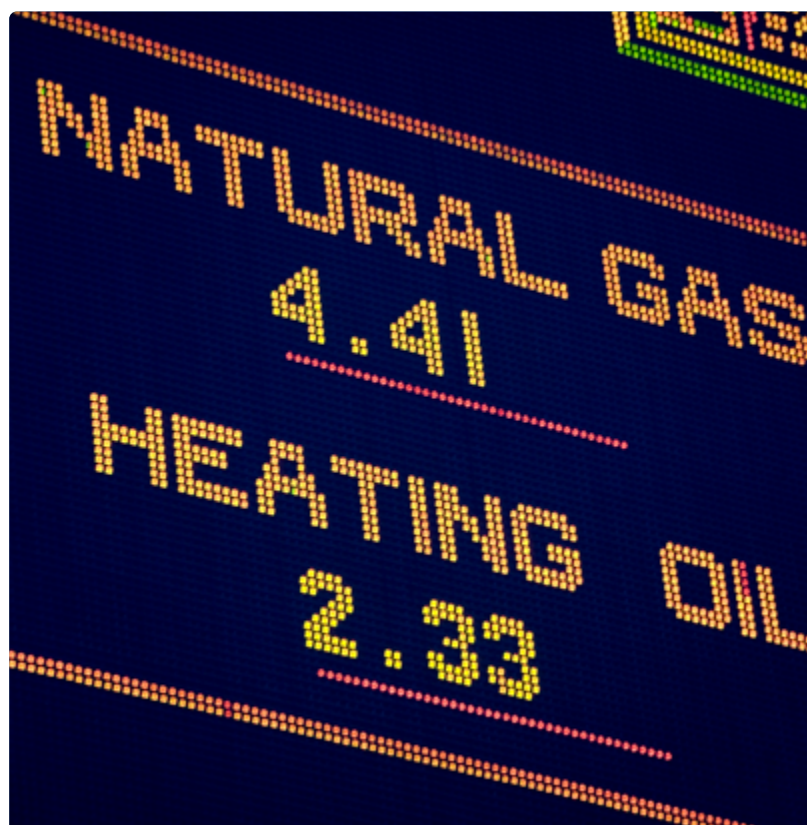
GHG emissions categories

- 1 Purchased goods and services
- 6 Business travel
- 11 Use of sold products
- 2 Capital goods
- 7 Employee commuting
- 12 End-of-life treatment of sold products
- 3 Fuel- and energy-related activities
- 8 Upstream leased assets
- 13 Downstream leased assets
- 4 Upstream transportation and distribution
- 9 Downstream transportation and distribution
- 14 Franchises
- 5 Waste generated in operations
- 10 Processing of sold products
- 15 Investments

Traders

Interestingly, energy and resources traders – perhaps spotting business opportunities as well as risk – tend to report on a wider number of areas, particularly category 1, relating to the purchase of goods and services; category 3, relating to fuel and energy use; and category 4, upstream transport and distribution.

However, this broader categorical coverage by traders belies a potentially even more fraught relationship with category 11 and the use of sold product. There is only one direct reference to trading in the GHG Protocols, which permits ‘power’ to be excluded if the counterparty is another trader. In practice, this principle has been extended by some traders to other value chains, whereby a commodity does not trigger Scope 3 emissions so long as the trading community are playing pass-the-parcel. Only the trader who finally sells to an end-user unwraps the emission.



Our principle of ‘First use’

A similar principle can be applied to the concept of ‘end-use’. The GHG Protocol distinguishes intermediate products from finished products, to avoid the potentially open-ended nature of a commodity’s life cycle. When advising clients in this area, we have applied a ‘first-use’ principle.

Using this approach, if we take bauxite as an example, we would calculate downstream emissions as far as the casting of an aluminium value-added-product (VAP) shape. The bauxite producer would not need to trace the metal as far as its use in a soda can or an aeroplane wing.

With all goodwill, when dealing with complex value-chains, meaningful reporting requires intelligent boundary-setting. This is unavoidable, but it also open to abuse. When organisations willfully dodge emissions disclosure, by either ignoring categories or using flawed methodologies and boundaries, the loser is not just the stakeholder who wishes to hold those organisations to account, but the organisations themselves. Under the inspection of increasingly sophisticated regulators, NGO’s, investors, lenders and customers, under-reporting will not pass muster.

“The GHG Protocol distinguishes intermediate products from finished products, to avoid the open-ended nature of a commodity’s use”

Act now, and watch this space

There is evidently a need for greater co-ordination and standardisation of emissions measurement and reporting within the energy and resources sectors, and we are in active talks with key players across the industry to facilitate this.

For those grappling with this today, the lack of a 'right answer' does not mean you can't reach good solutions. It just requires careful thought, in-depth knowledge of emissions measurement and a detailed understanding of your specific business activities and value chains. There may come a time when cookie-cutter emissions calculations tools and consultants will add value in this space, but that time is not now.

Keep in mind the point of the exercise: to create an emissions management system that can evolve to meet future use-case requirements, incentivise emissions reduction and enable value creation.

One pragmatic step you might consider now is to set aside questions of what to report and simply measure everything you can to the highest degree of accuracy and granularity that is reasonably achievable. By not limiting your internal measurement to what is required for external reporting, you will increase your optionality should risks or regulations arise, and you will develop a data resource that will present you with new insights and opportunities.

“By expanding internal measurement beyond external reporting requirements, you will increase your optionality should risks or regulations arise.”





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