# Portfolio life-cycle emissions

All credible third-party net-zero carbon emissions scenarios reflect the critical role oil and natural gas play in growing modern economies and improving quality of life. While these scenarios may differ in the speed at which these forms of energy will be displaced, all agree that oil and natural gas and the products produced from them will remain essential for decades to come.

It is also clear that the combustion of oil and gas generates $CO_2$ emissions that pose a risk in the form of climate change. These emissions, generated across a global energy system built over the last century for trillions of dollars, must be reduced. At the same time, we must continue to meet society's critical need for affordable energy by investing trillions of dollars more in capacity to help more than a billion people escape poverty. Addressing both requires serious thought, an objective assessment of the challenges, and actionable plans, anchored in reality.

We need to develop solutions that address the problem – emissions – while continuing to meet societal needs. All solutions should be on the table. Viable solutions must be affordable, reliable, and available at scale – to span the globe. We need a measurement system that objectively evaluates the amount of emission reduced and the associated cost. To do this, society will require sound policy (the U.S. Inflation Reduction Act, with a focus on carbon intensity, was a good start) that supports the growth of efficient emission-reduction solutions. Equally important, but far less discussed, is the imperative for an effective method to account for emissions. This is critical to understand how to affordably meet society's growing energy needs while efficiently reducing emissions.

Regrettably, there is no existing, comprehensive carbon "accounting system" for greenhouse gas emissions. The current, widely used proxy is the GHG Protocol, which divides absolute emissions into different categories (Scope 1, 2 and 3). When applied to a company, the emissions calculated for each category are:

- Scope 1 emissions, the direct result of a company's operations.
- Scope 2 emissions, associated with a company's third-party purchases of electricity, steam, heat and cooling (e.g., emissions from a power company).
- Scope 3 emissions, all indirect emissions (not included in Scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions.

Designed decades ago, the Protocol was intended to draw attention to not just direct emissions but indirect emissions, creating more transparency to the full scope of societal activities that would need to be addressed to tackle climate change. However, it is far less effective at assessing a company's emissions efficiency or comparing the emission intensity of alternatives. Using the Protocol to understand how societal activities generate emissions at a macro level is appropriate and useful; using anything other than Scope 1 emissions as an assessment tool to measure and manage company or sector-wide emissions is flawed with the potential for significant, unintended consequences.

The most obvious shortcoming of the GHG Protocol is the double-counting of emissions. ExxonMobil's Scope 2 emissions are the power company's Scope 1; our Scope 3 emissions are the consumer's Scope 1; our Scope 1 are a factory's Scope 2; and so on. There is no viable method of quantifying emissions and the impact of reduction steps when the same emissions are counted repeatedly. Making a company responsible for reductions, with targets, outside of Scope 1 emissions, distorts accountability and undermines the incentive for each responsible party to act. When everybody is responsible, nobody is responsible.

A particularly flawed application of the Protocol is holding suppliers accountable for their customers' choices and their resulting absolute emissions (Scope 3). It disincentivizes supply but does not change demand. When responsible producers stop supplying product, the remaining demand is met by other producers, potentially less responsibly. Production and emissions are not reduced, just moved.

**Case study:** Does it matter which company makes the gasoline you buy? Company A is an experienced, large, publicly traded company with a focus on emissions reporting and transparency. Company B is in the same business as Company A but is in a location where it is not subject to the same standards. If Company A is forced to reduce supply to meet absolute Scope 3 emission reduction targets, that demand will be met by Company B, with the resulting emissions required to meet demand being higher.

**Case study:** What happens when demand is not met? Prices go up. This was demonstrated when Russia shut off gas supply to Europe. Fuel switching was another outcome as Europe burned more coal, resulting in higher emissions compared to natural gas.

Since the GHG Protocol is an absolute measure, it can't be used to compare alternatives to determine the least emission-intensive option for meeting demand or an established need. Large producers will have large emissions even if they make a product with fewer emissions than a smaller producer making a lower volume of the same product. The trade-offs between alternative products that meet the same need with different levels of emissions also can't be assessed. Without a relative measure of emissions intensity, it isn't possible to identify and promote the most responsible energy producers, the lowest-emission products, and the most effective technologies in efficiently reducing emissions. Setting targets for absolute reductions without understanding the relative emissions intensity will disincentivize the most responsible and efficient producers and the lowest-emission products from growing – benefiting less efficient producers and products.

Because the GHG Protocol does not allow for relative assessments, it doesn't account for the avoided emissions associated with a product from one value chain or company (e.g., liquefied natural gas) replacing a product with higher emissions from an alternative value chain or company (e.g., coal). Replacing coal with liquefied natural gas (LNG) in power generation results in up to 60% reduction in $CO_2$ emissions.[1] However, a company producing LNG used to replace coal is penalized for its additional production and emissions, despite the significant overall emission benefits from the reduced use of coal. As a result, there is no incentive for a company to produce an energy product meaningfully lower in emissions when its emission performance is evaluated using the GHG Protocol – an unintended consequence resulting from the misuse of the Protocol.

In addition, the Protocol does not recognize third-party abated emissions. It does not give credit for a company's activities to help another company reduce its emissions. For example, ExxonMobil's calculated emissions under the Protocol will go up as we grow a carbon capture and storage business to eliminate a far greater amount of emissions from hard-to-decarbonize industrial companies. Measuring a company's effort to reduce societal emissions using the GHG Protocol will disincentivize necessary investments to help third parties reduce emissions at scale.

The issues highlighted above are a result of using an established metric, the GHG Protocol, to measure the right thing (emissions reductions) in the wrong way (assessments and targets on absolute Scope 2 and 3 emissions). Doing this penalizes companies like ExxonMobil for their size and their efforts to help others reduce their emissions through services and products like carbon capture, plastics, biofuels, and LNG. An effective assessment of the most responsible operator, with the lowest emission intensity, producing products that lower society's overall emissions is critically important to achieving significant reductions while continuing to meet society's critical needs.

To do this, we need a carbon measurement and accounting system, along with an assessment approach, that encourages the right actions. It should allow comparisons of alternatives at a company level (e.g., the emissions generated by two of companies of different sizes, making the same product) and at a product level (e.g., alternative products meeting the same need). It should also incentivize the least emission-intense companies to invest to meet society's growing need for affordable energy, with lower emissions.

A shift to carbon intensity (the emissions associated with a fixed volume of production) enables a fair comparison of the emissions efficiency of companies making the same product – irrespective of their size. It will incentivize companies to reduce emissions by growing lower emissions-intensive products to replace higher-emission alternatives. Finally, it allows comparison of different products that meet the same need to help ensure that higher-emission products are replaced with equally viable, lower-emission alternatives (e.g., coal vs. LNG).

To be effective, the system must account for the emissions associated with the development, deployment, use, and disposal of a product, commonly referred to as a Life Cycle Approach (LCA). An LCA is the only way to ensure a comprehensive accounting for the emissions associated with fulfilling society's needs. It allows for fully informed decisions when establishing policies and making choices because it accounts for **all** the relevant emissions. For instance, when comparing gasoline-powered engines to electric vehicles (EVs), it is important to account not just for tailpipe emissions but also for emissions associated with generating the electricity or producing the gasoline. A serious approach to addressing the threat of climate change must be grounded in an objective methodology focused on assessing and eliminating **all** emissions – not just those associated with oil and gas – and continuing to meet society's needs. We must do both.

LCA will help with this:

- There is no double-counting – emissions that are associated with making and using a product are only accounted for once along the value chain.
- There are no distortions in accountability – activities establish emissions, participation in the activities establishes accountability.
- There are opportunities for informed trade-offs – comprehensive accounting across the life of each alternative fully informs decision making.
- It recognizes societal needs – allowing comparisons between the available alternatives to meet established demands and critical needs.

A problem as serious as climate change requires objective thinking and problem-solving centered on data and facts, using tools, methodologies, and accounting that are equally objective and just as serious. Today, that doesn't exist, as policies and solutions being pursued lack a comprehensive analysis that factors in all relevant challenges. As a result, desired outcomes are not achieved, results are often regressive, and progress is slow. That is not good enough. It is time to get real and do the math. The world deserves better.

## Footnote

1. Based on ExxonMobil analysis for power plant use including EIA U.S. electricity net generation and resulting $CO_2$ emissions: https://www.eia.gov/tools/faqs/faq.php?id=74&t=11. Reductions may vary based on regional differences and other variables.