TASA
ANALYTICS

FROM AVERAGE TO UNIQUE SUPPLY CHAIN EMISSIONS FACTORS

A HYBRID-PATH EMISSIONS FACTOR APPROACH

FOREWORD

In the face of increasingly evident climate change impacts, governments, standards bodies, and companies themselves are elevating the importance of measuring and managing scope 3 emissions—those that are outside of the owned or controlled operations of the reporting organization, but within the influence of the organization and its value chain. As a result, a surge of scope 3 regulations, standards, and downstream net zero targets and commitments are converging at the doorsteps of today's companies – large and small.

The ability to identify and target investment for scope 3 emissions reductions has not been easy. In fact, the vast majority of companies have made little progress to date for three primary reasons: (1) they haven't had to – GHG Protocol and related reporting standards have largely left scope 3 measurement and reporting as optional, until recently; (2) there can be uncertainty of responsibility and attribution due to double-counting measurement challenges (i.e., scope 3 is someone else's scope 1) – though these can largely be addressed through technical and contractual arrangements; and, (3) the transactions costs of monitoring and verifying uncertain scope 3 emissions are theoretically infinite. While the first two challenges are largely finding solutions, the third challenge of visibility into the structure of companies' unique value chain emissions has proven to be much more sticky and is key to climate action.

In this report, we present a hybrid-path emissions factor (H-PEF) approach to improve visibility into the emissions structure of unique supply chains, helping companies transition away from highly aggregated and averaged emissions factors, that are largely incomparable and unacceptable for decision-making, to multi-tier and multi-regional estimates incorporating increasingly available (but still largely incomplete) supplier-provided and unit-process data.

Given the urgency for climate action, there is no time to wait for "better" data or "silver bullet" technologies. We can act today, based on the right combination of comprehensiveness and specificity provided by hybrid approaches like the one presented in this report, and begin the real work of meeting net zero commitments.

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CURRENT STATE

SCOPE 3 MEASUREMENT

Hybrid methods are likely to improve both accuracy and precision through the integration of top-down, bottom-up, and inside-out approaches to scope 3 accounting

Scope 3 GHG accounting is fraught with methodological challenges, leading to wildly varying results across similar value chains and making it nearly impossible to compare the reported values of one company to the next. This poses significant difficulties for investors, sourcing managers, and other stakeholders seeking to mitigate climate risks within their spheres of influence. While data quality and availability can certainly be issues, much of this variability can be explained by different scopes and system boundaries across approaches. Some of the differences (and similarities) of the most commonly applied approaches for calculating scope 3 emissions are briefly discussed for context and introduction – these are: process-based life cycle assessment (P-LCA), environmentally-extended input-output life cycle assessment (EEIO), supplier-reported emissions based on the Greenhouse Gas Protocol, and hybrid approaches at both product and organizational levels.

The first two approaches fit within the general category of life cycle assessment (LCA), used to quantify embodied environmental flows and effects of product and technology systems. A key element of any LCA is the compilation of a life cycle inventory (LCI), which sums all material and energy flows in and out of the system and is often described by the book-ends of process-based and economic input-output approaches. Process-based LCIs are usually referred to as a bottom-up approaches, whereby specific data is collected for each unit process which in aggregate represent the whole of the technology system. While often considered to produce greater precision, process-based approaches are time-consuming, expensive, and impractical across the variety of products and services comprising a reporting company's scope 3 emissions. In addition, particularly for products with long, complex supply chains, bottom-up inventory approaches suffer from systematic truncation error (Majeau-Bettez et al., 2011), as it is nearly impossible to collect specific data representative of all unit processes of any given system – in short, some things get left out.

Environmentally extended input-output (EEIO) approaches, often referred to as a top-down approaches, use data collected from governmental statistical agencies and estimate the economic transactions between every sector of a national economy (Leontief 1970). Because this approach is built upon production and consumption data, once it is appended with satellite emissions data, post-sale use and end-of-life phases are omitted. In addition, this high-level approach results in relatively coarse resolution inventories provided at the sector level, obscuring comparisons of practices within a specific sector. What is lost in detail is, however, gained by EEIO's comprehensiveness. For this reason, EEIO can often provide important insights into an accurate assessment of total emissions associated with upstream scope 3 emissions, particularly those associated with purchased goods, services and capital.

The third approach used to assess scope 3 emissions is built upon the Greenhouse Gas Protocol (GHGP), the most often followed standard for supplier-provided, reported emissions calculations. Scopes 1 and 2 emissions – direct emissions and emissions embedded in direct-purchased electricity and heat - have consistently been the only emissions required by reporting companies for compliance, whereas scope 3 has until recently remained largely optional. As a result, scope 3 emissions are often not reported, and when they are, they are often under-reported by 50% or more (Klaaßen and Stoll 2021). These data can provide useful supplier-specific information, when it comes to upstream emissions, but current practice creates numerous challenges across facility-, production line- and product-level specificity, let alone complexities across organizational supply chain ownership boundaries.

Lastly, hybrid life cycle assessment (H-LCA) and organizational LCA (O-LCA) have been well documented in the academic literature for decades. H-LCA utilizes process and input-output data to reinforce their individual strengths, while aiming to mitigate their respective weaknesses (Suh et al.,2004). Similarly, O-LCA uses a life cycle perspective to compile and evaluate the inputs, outputs and potential environmental impacts of the activities associated with an organization, as well as the provision of its product portfolio. Each of these approaches come at a price of complexity and cost – limiting their adoption in practice. All of this to say, and not without debate, hybrid analyses are likely to improve both accuracy and precision (Martinez-Blanco et al., 2015; Yang, 2017a; Yang et al., 2017; Schaubroeck and Gibon, 2017; Yang, 2017b; Pomponi and Lenzen, 2018).

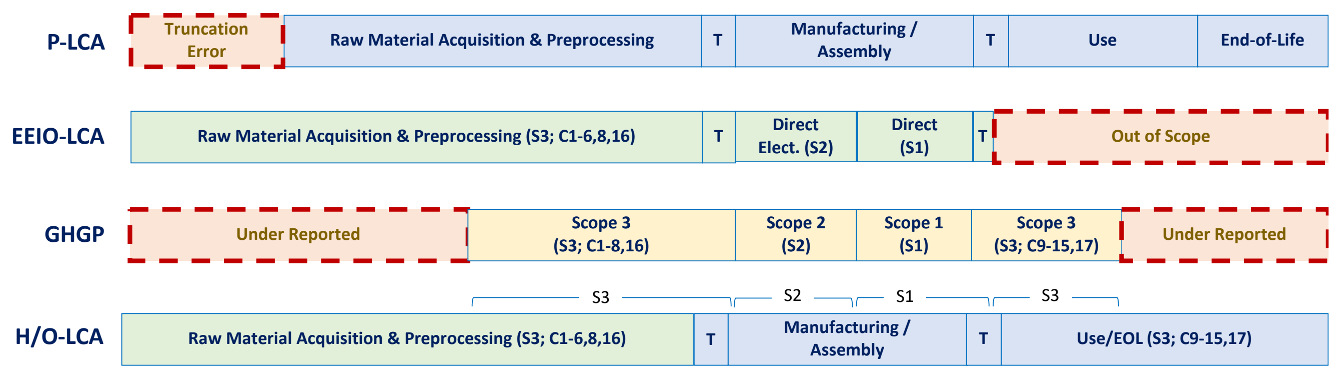


Fig 1. Typical data and calculation approaches applied to scope 3 emissions. Together they can help provide an increasingly more accurate and precise representation of a company's unique product, technology, and supply chain system.

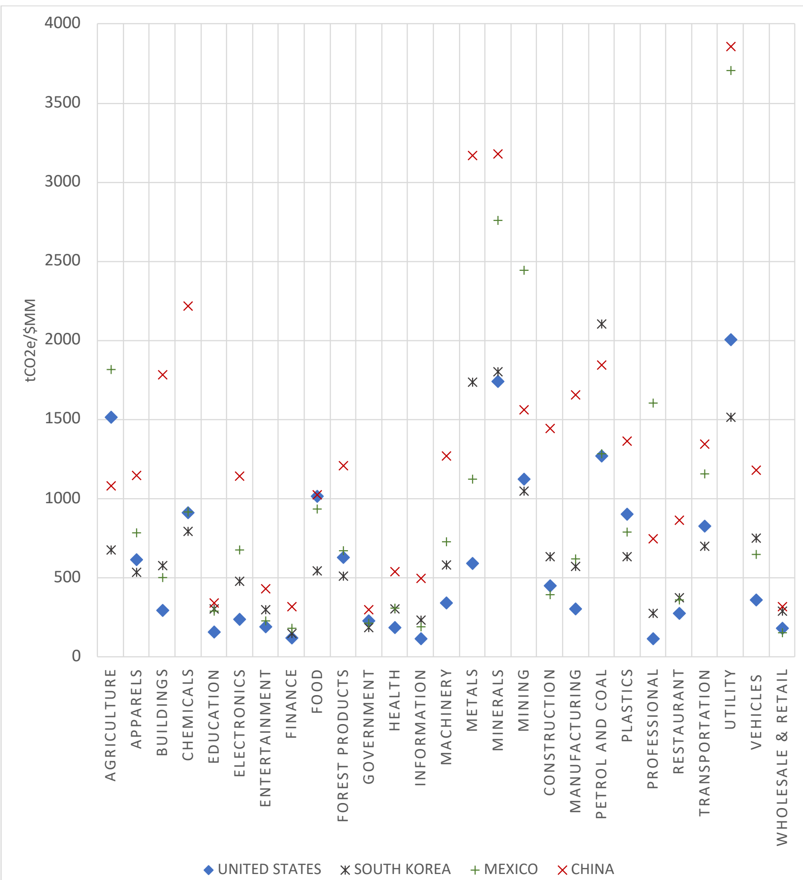
HYBRID-PATH EMISSIONS FACTORS

TOWARD A UNIQUE SUPPLY CHAIN ASSESSMENT

The organizational and path exchange hybrid approaches utilized in the sections that follow, and referred to throughout as Hybrid-Path Emissions Factors (H-PEF), have been extensively described in the literature (Pelton et al. 2015 & 2016; Lenzen and Crawford, 2009; Treloar, 1997), and are based on the assumption that process and environmentally extended input-output models are, generally speaking, two different ways of describing similar value chains. The vast majority of the literature exploring path-exchange LCA approaches have been theoretical in nature, assuming data completeness of both EEIO and P-LCA structural data as inputs. But, in practice, P-LCA is not available across the many product systems (and virtually no service systems) of a complex supply chain. In the absence of this full data, H-PEF relies on the mutually exclusive nature of input-output-based supply chain footprint analyses and targets priority areas of any economic sector's emissions structure for exchange with available P-LCA and supplier-reported data. Thus, H-PEFs reflect a more unique emissions profile of the specific supply chain system while maintaining the system boundary completeness provided by the more general sector-level input-output model.

CONSISTENT NATIONAL EEIO MODELS

The use of EEIO data for "spend-based" scope 3 accounting is often criticized for being outdated, reliant on single country or highly aggregated global models, and incomparable across suppliers or mitigation technologies (e.g. producing the common refrain, "the only way to reduce emissions is to spend less"). The H-PEF approach addresses each of these challenges by utilizing recent high-resolution national models and customizing them with multi-regional, specific supply chain data to improve comparability. Our approach to construct national EEIO models uses methodologies consistent with recently published comprehensive EEIO models, most notably USEEIO and KREEIO developed in collaboration with USEPA and the National Research Foundation of Korea, by members of the TASA Analytics team (Yang and Suh, 2011; Yang et al., 2017; Yang et al., 2022; Ingwersen et al., 2022).



Geographic location can influence the emissions of production by 2-4X due to differences in fuel mix, productivity, and economic factors

Fig 2. Comparison of industry category emissions factors by country of production (tCO2e/$MM).

TASA Analytics' best-in-class, full, national EEIO models account for approximately 70% of global production and are built upon the most recent economic (2012-2017) and emissions (2012-2021) data available. Figure 2 presents a snapshot of the variability in emissions intensity of production across high-level industry sector categories across a sample of four different countries, highlighting how geographic location can significantly impact embedded emissions.

PATH EXPANSION OF SUPPLY CHAIN EMISSIONS

By conducting structural path analysis (SPA) on each sector's EEIO model outputs (Suh and Heijungs, 2007; Yang et al., 2022), TASA's EEIO emissions factors create multi-tier visibility into the emissions structure of all required inputs to produce a dollar of sector output. As such, from a supply chain perspective, SPA provides an estimate of the upstream production-consumption networks contributing to the emissions at a producer's production gate.

Results of this analysis produce a representation of the economy-wide supply network structure, and is analogous to the direct and indirect tier structure of a producer's upstream supply chain (Figure 3). Similarly, direct emissions associated with the added-value of a sector's production (per dollar of output) is analogous to the revenue-normalized scope 1 emissions reported by an average producing company within that sector. Likewise, indirect emissions attributed to directly purchased electricity, required for the production of the same dollar of sector output, is analogous to the average producer's revenue-normalized scope 2 emissions. Finally, all other indirect emissions associated with each tier's direct and indirect emissions of required inputs represent the average producer's upstream scope 3 emissions intensity.

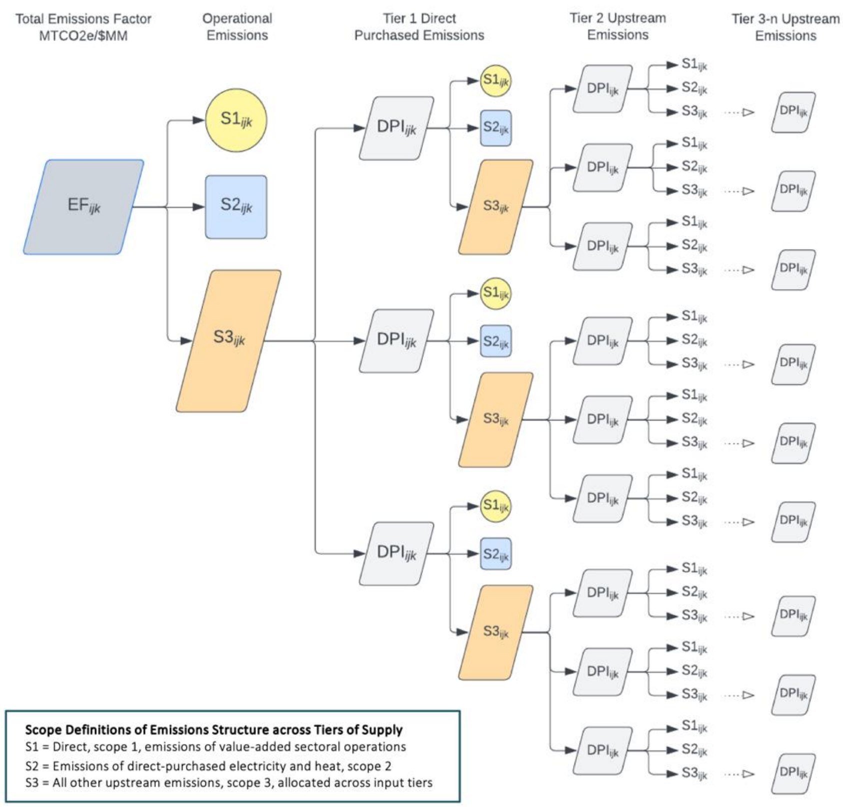


Fig 3. Expanded structure of supply chain emissions intensity (tCO2e/$MM) by emissions scope and tier for country *i*, sector *j*, tier *k* (DPI = direct purchased input, excluding purchased electricity and heat accounted for in scope 2)

HYBRID-PATH EXCHANGE

Based on the equivalence assumption across life cycle inventory approaches and the unique structure of monetary Leontief input-output systems, it is possible to establish concordance between the emissions structure of top-down EEIO/SPA sector nodes/pathways, unit process maps identified through bottom-up LCIs, and supplier-reported emissions. This enables the substitution, or exchange, of top-down input-output inventories with more precise, bottom-up process data and supplier-reported data (Figure 4). H-PEF leverages the systemically complete coverage and structural input-output relationships of top-down economy-wide EEIO models and exchanges these general input paths with more specific inventories determined through bottom-up P-LCA and inside-out supplier-provided activity and reported data. In short, it allows for an assessment of specific products differentiated by the technologies and processes adopted by unique supply chains, while maintaining the system boundary completeness of the EEIO sector class (Crawford et al., 2018; Stephan et al. 2019). In addition, by hybridizing an overarching input-output system at the structural path-level, we also avoid double-counting, reduce widespread system disturbance, and increase its application by limiting the requirement for external information.

The identification of corresponding input-output and process nodes is based on the assumption that an input-output node-path structure and a process or activity-based node-path structure are equivalent, if representing the same sub-system of the supply chain. Correspondence matching at this time relies on expert knowledge of the TASA team and client users, but more sophisticated and automated approaches are being explored for future application.

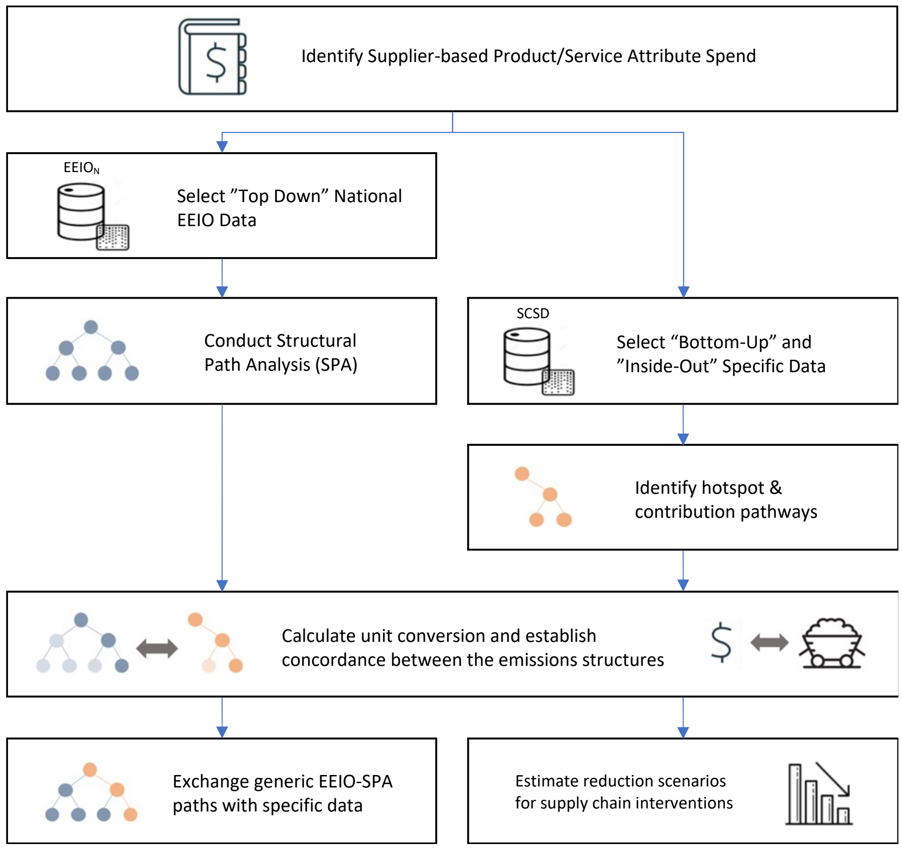


Fig 4. Conceptual flow diagram for the H-PEF Protocol (adapted from Stephan et al. 2019 and Pelton et al. 2016)

Once the process of identifying correspondences has been completed, the hybrid value for specific environmental flows can be calculated. The direct intensities associated with process/reported nodes are converted from physical units to financial units, based on the economic value of the product or service modelled. With supplier-reported data, at either the facility or organizational levels, pathway relationships of an exchanged node are adjusted proportionally to the IO-derived values. As high-quality and accessible process-based data emerges, more complex approaches to facilitate matching environmental flows further upstream in a process model become possible. While outside of the scope of this paper, these approaches are currently being deployed for existing clients to integrate P-LCA, EEIO, and company/facility data to establish unique H-PEF estimates. The final step of the path-exchange protocol is to sum the newly applied process/reported values and remaining input-output components to obtain the hybrid emissions value of a unique supply chain carbon footprint.

Results from this hybridization create insights into the variability often seen across P-LCA studies and company-reported information. Through a stylized representation of two unique supply chains, we illustrate how regionality, technological specification, and supplier-specific organizational ownership boundaries can significantly alter the footprint of the supply chain system. In Figure 5, supply chains 1 and 2 are compared based on a progressive set of data environments used in the H-PEF approach. Simple "spend-based" approaches to scope 3 footprinting often rely on a single EEIO model (e.g., the use of US EPA's USEEIO model or the EXIOBASE multi-regional global model) to establish emissions factors for purchased goods, services or capital inputs. Panels a1 and a2 illustrate how, at this level, the two product systems produced under different technological and organizational supply chain conditions are characterized to reflect the industry sector to which the products report into. Thus, the footprint calculated is the same for both products (400 tCO_2e/$MM), and the structural paths of contributing scopes and required inputs also reflect the same single industry sector to which the products belong.

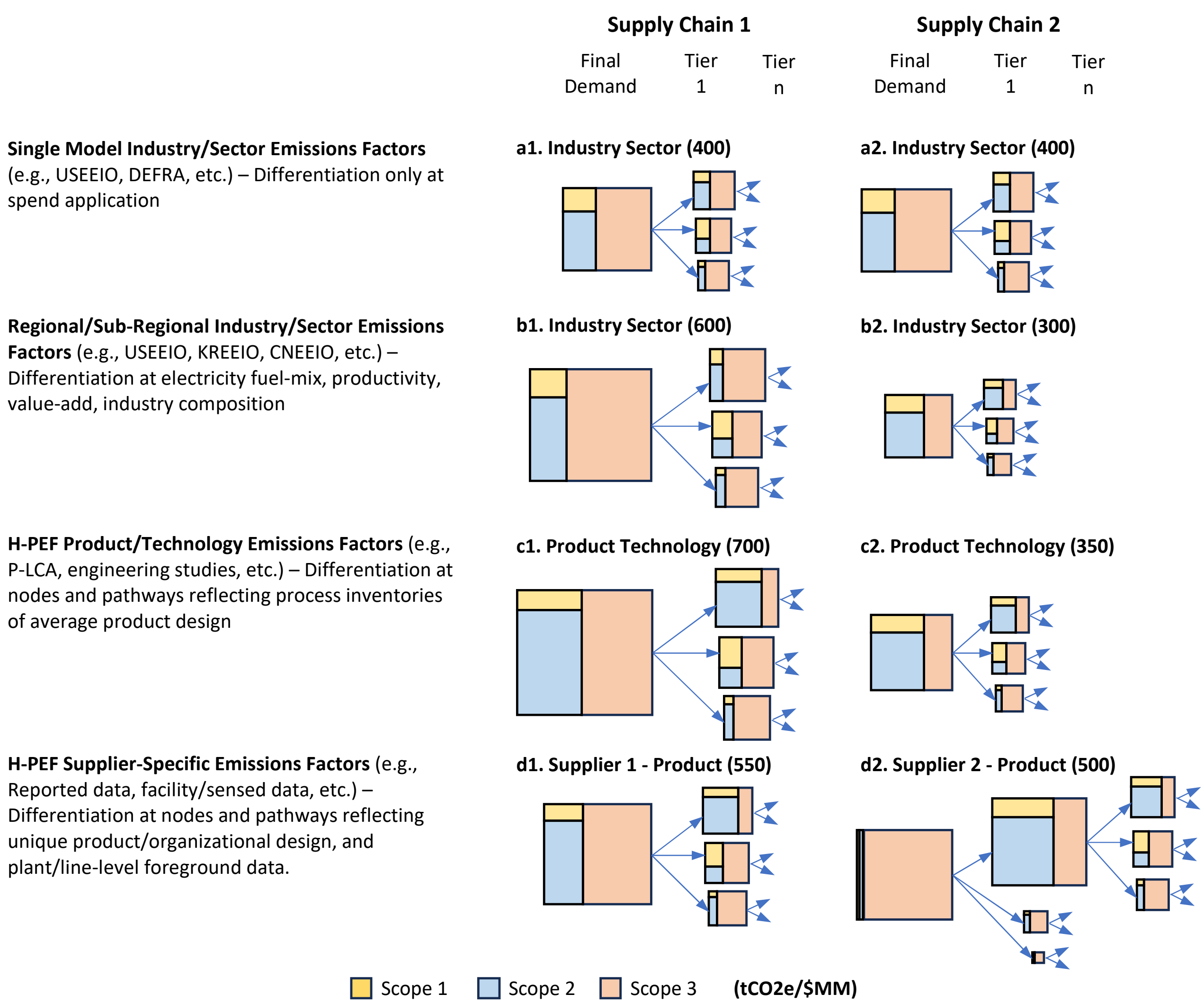
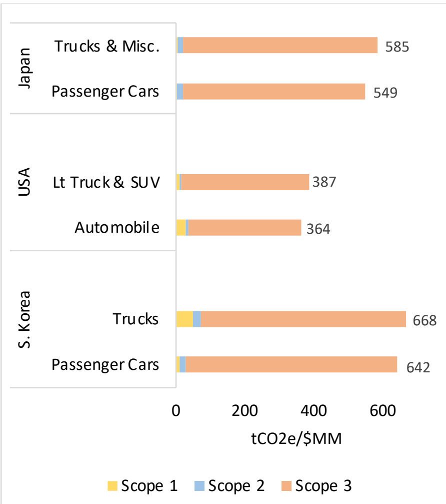


Fig 5. Hybrid-Path Emissions Factor (H-PEF) methodology's progression from incomparable single model EEIO emissions factors to muti-regional, multi-tier, supplier-specific emissions factors due to the exchange of generic node/path contributions with product-, process- and organizationally-specific information. Results provide increasingly comparable estimates of both emissions intensity and emissions structure of the supply chain. Size of the final demand box represents the total embedded emissions of the product system (scope 1 = yellow, scope 2 =blue, scope 3 = orange). Tier 1-n boxes represent disaggregation of scope 3 emissions, by tier. Values in parentheses reflect a hypothetical emissions intensity in tCO_2e/$MM.

If we allow for the differences in emissions intensities across countries of production to influence our assessment (panels b1 and b2), a product system produced in China or Taiwan could hold significantly higher embedded emissions than one produced in the US or Japan. Hybridization of process-based and engineering data allowing for substitution of technology-specific energy, material, and chemical inputs of the unique product system (panels c1 and c2) begin to expand the emissions characterization beyond the industry sector of a particular product category. In this case, we might be comparing electric vehicles, plug-in hybrid electric vehicles, hybrid electric vehicles or traditional combustion engine vehicles within a broader passenger vehicle industry sector of the US, Japan or South Korea. Finally, company-provided foreground information is accounted for in panels d1 and d2, whereby specific energy use data from facilities and manufacturing lines are incorporated into the assessment, along with renewable energy investments, emissions abatement technologies, process efficiencies impacting material or energy requirements. Organizational ownership boundaries are also accounted for, shifting emissions across tiers of production to account for contract manufacturing, dependencies on leased capital or multi-regional technology partnerships. In these cases, the H-PEF assessment accounts for both differences in overall emissions magnitude and emissions structure of the footprint.



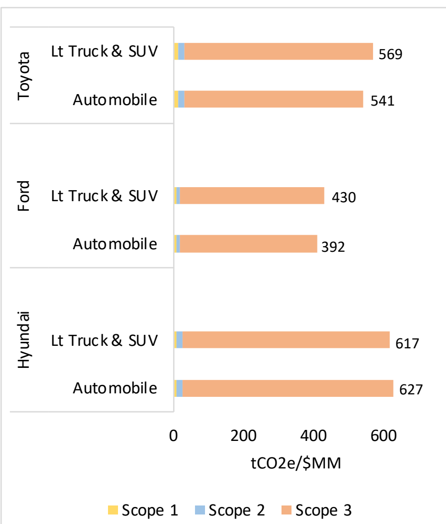


Fig 6. TASA's National EEIO and Company-Adjusted H-PEF Emissions Factors (2022 reference year)

Comparable, company-specific emissions estimates are gaining traction among leading companies seeking to not only

H-PEF IN ACTION

A SIMPLE EXAMPLE OF COMPANY-SPECIFIC EMISSIONS IN THE AUTO INDUSTRY

For illustrative purposes, we use the automotive manufacturing industry as an example of a simple H-PEF application. In this case, publicly available reported information captured through CDP GHG emissions reports and data provided to the U.S. National Highway Traffic Safety Administration's (NHTSA) American Automobile Labeling Act (AALA) Reports is used to reflect a more company-specific representation of Toyota, Ford and Hyundai cars and light trucks and sport utility vehicles (SUVs).

FROM EEIO TO H-PEF

Generic EEIO factors for automobile and other truck and specialty vehicles for the three headquarters' countries of the companies analyzed are provided in the top panel of Fig 6. Like the earlier discussion of Fig 2, emissions intensity varies by economic activity and location. Slightly more emissions are consistently embedded in the production of light trucks and SUVs than in the production of automobiles. More significant differences are seen between production locations, where cars produced in South Korea in 2022 are found to be approximately 75% more carbon intensive than cars produced in the United States, and 17% more intensive than those produced in Japan. In addition, the well-established dominance of upstream scope 3 emissions of complex vehicle production systems is represented in these emissions factors.

While the structure and overall magnitude of company-specific H-PEF largely reflect the underlying EEIO data, meaningful differences emerge between companies and products with only modest integration of company reported data. First, company reported scope 1 emissions data by location sheds additional light on the relative intensity of production operations across the globe. For example, Hyundai reported significant direct emissions from China, Russia, Czechia, India and the U.S., in addition to its primary operations in South Korea (66%). Similarly, Ford reports 16% of its direct emissions as being generated in Europe, and only 56% of Toyota's direct emissions are created in Japan, with significant operations in the U.S. (18%).

disclose, but manage emissions performance

Table 1. Comparative metrics of firm-level GHG supply chain exposure

Ford Motor Company (2022)	
Revenue ($)	$158,060,000,000
Earnings (EBIT)	$6,409,000,000
$kgCO_2e$ (H-PEF Calculated)	67,965,800,000
$kgCO_2e$/Revenue	0.430
CO_2 Exposure/Earnings ($)	54.1%
Revenue/Share	$39.38
Earnings/Share (EBIT)	$1.60
Share Price (P/S)	$14.87
$kgCO_2e$/Share	16.933
$kgCO_2e$/Share Price	1.139
CO_2 Exposure/Share ($)	$0.86
CO_2 Exposure/Share Price	5.8%
Toyota Motor Corporation (2022)	
Revenue ($)	$240,084,608,057
Earnings (EBIT)	$20,849,173,926
$kgCO_2e$ (H-PEF Calculated)	131,566,365,215
$kgCO_2e$/Revenue	0.548
CO_2 Exposure/Earnings	32.2%
Revenue/Share	$172.85
Earnings/Share (EBIT)	$15.01
Share Price (P/S)	$16.02
$kgCO_2e$/Share	94.720
$kgCO_2e$/Share Price	5.912
CO_2 Exposure/Share ($)	$4.83
CO_2 Exposure/Share Price	30.1%
Hyundai Motor Company (2022)	
Revenue ($)	$105,042,793,295
Earnings (EBIT)	$7,241,151,027
$kgCO_2e$ (H-PEF Calculated)	65,563,453,267
$kgCO_2e$/Revenue	0.624
CO_2 Exposure/Earnings	46.2%
Revenue/Share	$403.86
Earnings/Share (EBIT)	$27.84
Share Price (P/S)	$64.83
$kgCO_2e$/Share	252.070
$kgCO_2e$/Share Price	3.888
CO_2 Exposure/Share ($)	$12.86
CO_2 Exposure/Share Price	19.8%

Data reported into the AALA registry also provides additional specificity of the distribution of parts produced in the US and Canada versus other locations around the world. These data, for example, report that, on average, approximately 48% of Ford's vehicles sold in the US contain non-US/CA components. Most of these parts originate from Mexico. Similarly, sales weighted estimates of Toyota's vehicles sold in the U.S. contain approximately 33% of parts and components produced in the U.S.

Company specific scope 1 and scope 2 (market-basis) values are incorporated into the results and are provided in the bottom panel of Fig 6. The EEIO calculated values are exchanged for the companies' reported revenue normalized values. The contribution of these emissions is relatively small, regardless of calculation approach. By each company's reported values, these operational emissions contribute between 5% and 10% of total reported emissions, with the variability – and total magnitude – largely attributed to the completeness of scope 3 reporting.

Finally, in Fig 7 we illustrate the calculated H-PEF emissions structure for Ford Motor Company, disaggregating upstream scope 3 emissions to account for the highest impact inputs. While only incorporating modest levels of publicly available company-specific data, the impacts associated with parts and sub-assemblies provided by original equipment manufacturers (OEMs) is evident in the tier 1 supply flows. Emissions embedded in the direct purchase of plastic and rubber, as well as primary metal products, also emerge. However, the multi-tier approach to the analysis highlights how primary and fabricated metal parts in tier 2 are much larger contributors to Ford's GHG footprint than metal products directly purchased.

APPLICATION INSIGHTS

Applications for comparable company-specific emissions estimates are increasingly gaining traction among leading companies and organizations seeking to not only disclose historical footprints, but also manage emissions performance.

A common use of sector-level emissions factors, or by extension company-level H-PEF, is in the calculation of emissions embedded in purchased goods and services (scope 3, categories 1 & 2 in most instances), commonly referred to as spend-based approaches. In this instance, we find that purchasing a $40,000 vehicle from Ford in 2022 might contain 17.2 tCO2e total embedded emissions, compared with a similar $40,000 vehicle from Toyota with 21.9 tCO2e embedded in the purchase. Therefore, from a purchasing perspective, it is fairly straight forward to assume that buying a Ford vehicle reduces upstream embedded emissions of the purchaser by 22% from a similar Toyota purchase, or 11% from an average fleet baseline comprised of equally distributed Toyota and Ford vehicles.

However, from a strategic sourcing perspective, it may be that because Toyota is a more profitable organization (at least in 2022), they may be in a more favorable position to collaborate with supply chain partners toward reductions. Toyota's GHG exposure to operating income ratio in 2022, calculated as $51/tonne[1] over earnings before interest and taxes, is much less (32%) than that of Ford (54%). In this case, supplier engagement efforts to align manufacturer upstream reduction efforts with downstream vehicle fleet emissions reduction targets might be met with greater success. Supplier engagement is not a transactional affair, particularly in the era of net zero targets.

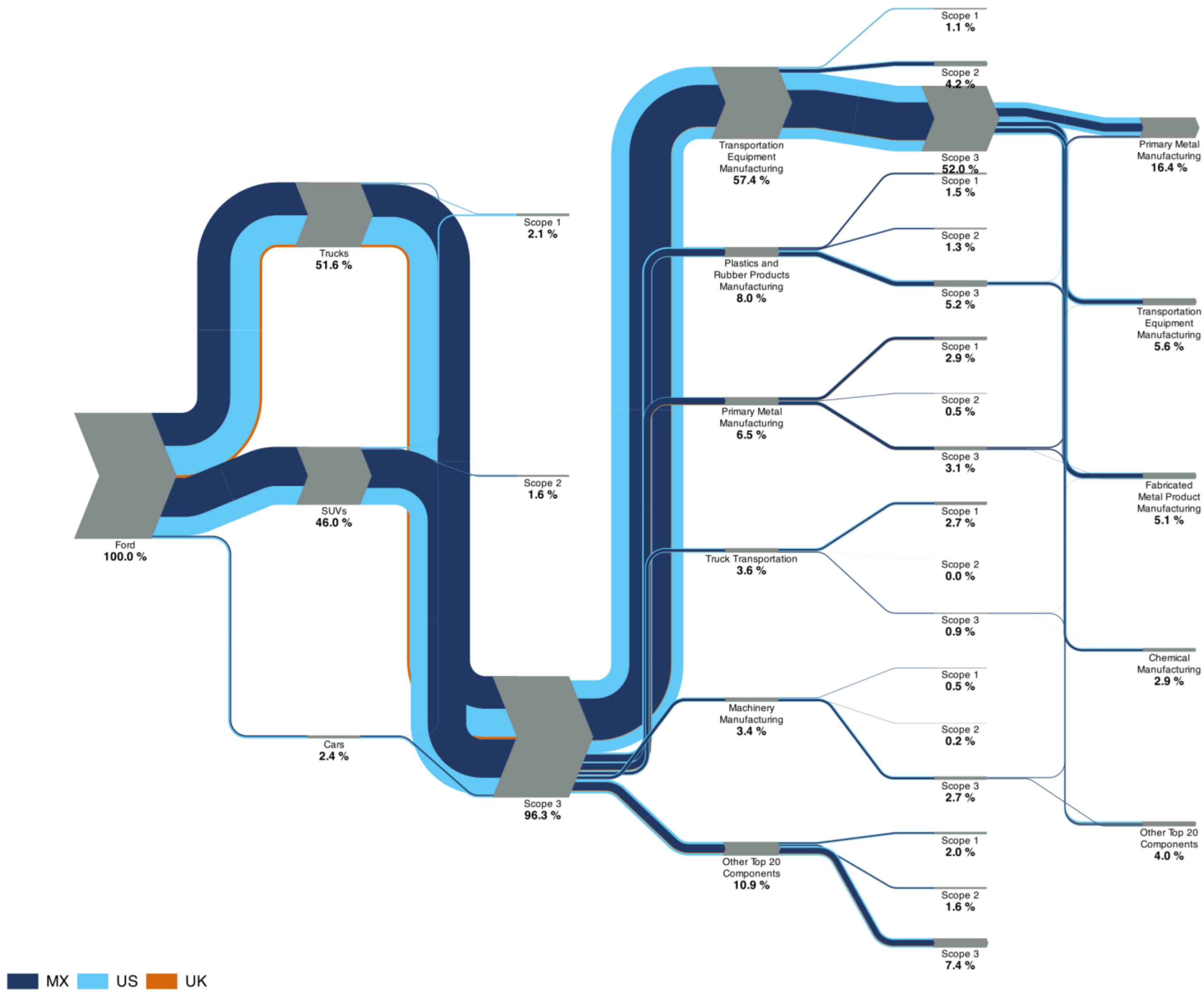


Fig 7. Illustrative representation of the emissions of Ford Motor Company's H-PEF structure – hotspot emissions through tiers 1 and 2 of supplied inputs. Ford's operational scope 1 and scope 2 emissions, by car and light truck/SUV, are illustrated by emissions flows in the left portion of the image. Ford's scope 3 emissions are illustrated by aggregated categories of the Top 20 contributing input sectors (93% of total scope 3 emissions) in the right portion of the image.

In addition to sourcing and purchasing applications, we also introduce a number of financial ratios incorporating emissions performance of both Ford and Toyota, again as an illustration (Table 1). Similar to the above discussion, whereby emissions exposure is acquired alongside the purchase of goods or services. We present analogous metrics in an investment context, such that emissions exposure is acquired with the purchase of a common share. In this case, we observe that the emissions embedded in a share of Hyundai stock is more that 2.5 times that of Toyota (252.1

[1] We use the Biden Administration's cost of carbon calculation as a proxy for illustrative purposes. Organization's implementing internal carbon fees or shadow prices have often placed a value of less than $10 on scope 3 emissions and the US EPA recently calculated the cost of carbon at $190/tonne. In short, our estimates are likely conservative estimates of climate risk exposure.

kgCO2e/share versus 94.7 kgCO2e/share), and 15 times that of Ford (16.9 kgCO2e/share). Perhaps more interesting is that carbon exposure comprises 30% of Toyota's share price versus 20% of Hyundai's share price and less than 6% of Ford's, suggesting that investor risk could be much more substantial in the case of Toyota. Obviously, longitudinal trends of these metrics over time would be required to make robust conclusions, but the comparative nature of H-PEF opens the door for company-level ESG assessment that more fully accounts for risk and opportunity across value chains.

CONCLUDING INSIGHTS

The time for climate action is now, near-term targets toward net zero ambitions are six years away with innovation and capital budgeting cycles expected to eat into any false sense of security that time remains to get our collective arms around measurement challenges. The methods presented in this paper are not perfect. They aren't as detailed, as certain, or as uniquely precise to specific companies or technologies as we would like. But, they are useful in helping managers make difficult decisions today, and leading companies are taking action. TASA is currently working with some of the largest and most climate-action-ambitious companies across technology, automotive and industrial manufacturing industries to scale these approaches across their supply chains, helping them move beyond reporting to managing impact.

Key insights important to furthering adoption and scaling of near-term climate action include:

- ◊ Hybrid approaches, like H-PEF, help quantify differences of impacts embedded in the prior decisions of companies (e.g., where they produce, investments in process efficiencies and abatement technologies, from where they purchase intermediate goods and services, etc.). ***Transitioning from generic to unique assessments of company emissions profiles allows managers to compare options and take action across all three scopes of its emissions profile.***
- ◊ As new and expanded regulatory reporting requirements come online (as early as next year), ***integrating hybrid approaches into carbon accounting and reporting systems, today, positions forward-looking companies to better take advantage of the new and higher-quality emissions data that is sure to result.***
- ◊ H-PEF helps companies target emissions reduction strategies. From the examples above, Ford Motor Company likely inherits over a million tonnes of carbon emissions each year in just the scope 2 electricity emissions of its tier 1 and tier 2 primary metal product suppliers. Ford's ability to influence and facilitate the acquisition of renewable power, or high-quality renewable energy certificates, in the production of its steel and aluminium inputs could meaningfully impact its emissions profile and signal leadership more broadly. ***H-PEF's multi-tier and multi-regional insights arm managers with the tools to confidently engage with suppliers and project developers, knowing where and how much interventions impact their value chain emissions.***
- ◊ Hybrid approaches are increasingly being recognized as an important path forward toward supply chain attribution of GHG mitigation projects. ***H-PEF identifies and informs attribution (absent of double-counting and increasingly representative of unique production-consumption systems) – a necessary requirement for increased climate coordination across supply chains, whether through ESG investment mechanisms, strategic sourcing partnerships, or collaborative project finance.***

TASA's team of researchers and experts are committed to the further development and application of innovative techniques toward climate action where it matters most. Please don't hesitate to reach out to us to continue the dialogue.

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TASA Analytics

Established as a platform to increase actionable academic-practitioner collaboration toward the acceleration of sustainability research, development, and implementation, TASA Analytics advises corporate and non-profit clients in the areas of greenhouse gas accounting, climate change mitigation and sustainability standards, commitments, and policy design. TASA's business model relies on its ability to attract and support the engagement of leading scholars in fields of industrial ecology, supply chain management and environmental accounting toward the development of cutting-edge and actionable tools to support decision-making.

TASA is a for-profit organization with a strong mission-driven orientation to further and accelerate sustainable innovation and solutions across production and consumption systems. As such, we maintain a dual purpose of (1) incentivizing the development and application of data and tools necessary to solving sustainability challenges, and (2) publishing peer-reviewed, high quality research papers and data to ensure transparency and replicability of data, models, and analytics.

Collaboration will be central to meeting sustainability challenges over the next two decades. As such, we recognize the need to drive, embrace and facilitate collaboration among and between researchers, practitioners and "problem owners". This allows TASA the ability to further develop data and models for their improvement and broader application beyond the engagement with a specific client, meeting our mission to accelerate the deployment of sustainability solutions.

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