A Common Industry Solution for Digital Reporting of Data Relevant for Maritime Emission Reporting

An open framework by the maritime industry, for the maritime industry — collaboratively developed and globally harmonised

Coordinated by the Tripartite Joint Industry Working Group (JIWG)

Executive summary

The maritime industry faces rapidly increasing requirements for accurate, transparent, and verifiable reporting of greenhouse gas (GHG) emissions across multiple, partially overlapping regulatory and commercial regimes. Regulatory schemes define what must be reported and when, often relying on annual or compliance-period aggregation of verified datasets with prescribed calculation methodologies, system boundaries, and audit requirements. Commercial mechanisms such as charter-party performance reporting, allocation of EU ETS costs, and FuelEU Maritime pooling or penalty settlement increasingly require voyage-, leg- or contract-level outputs on shorter timelines.

In practice, the same operational facts are repeatedly re-mapped, transformed and reconciled as data passes between onboard systems, shore organisations, verifiers and commercial counterparties. Raw operational data is validated against specific schemas, reconciled between onboard and shore records, aggregated to defined sequential and operational boundaries, and processed using rule-based calculations. Because these steps are implemented differently across fleets and service providers, divergent outcomes can occur even when based on similar source data. The result is higher cost, longer cycle times and avoidable inconsistency.

This white paper proposes an industry framework that prioritises interoperability at the interface level when data are collected, enabling consistent exchange and reuse of emissions-relevant operational data while allowing organisations to retain their internal reporting systems. The foundation is the Operational Vessel Data (OVD) framework: a vendor-neutral exchange layer for operational inputs such as log abstracts and noon report extracts. OVD provides shared definitions, structure, units and formats that reduce ambiguity, enable machine-to-machine exchange, and improve traceability. Building on this foundation, the framework also defines Vessel Emission Reports (VER) as standardised output structures for commercial reporting where consistent outputs and explicit assurance status are needed.

Tripartite is an industry forum bringing together representatives from shipowners and operators, shipbuilders, and classification societies to address shared technical, safety, environmental and regulatory challenges through coordinated, non-binding industry dialogue.

A Tripartite Joint Industry Working Group has been tasked to develop common approaches to digitalisation and data exchange that are grounded in operational practice and aligned with regulatory realities. The development of a harmonised framework by the maritime industry itself is essential to ensure that proposed solutions are practical, interoperable, and capable of broad adoption across diverse stakeholders.

The Tripartite JIWG invites industry stakeholders to engage in refining, adopting and governing the OVD-based exchange framework and its associated protocols. Broad uptake of a stable operational exchange layer is the most effective lever for reducing fragmentation, because it

supports multiple regulatory and commercial uses without requiring changes to onboard routines or mandating a specific software platform.

1. Background and drivers

The maritime sector is undergoing a fundamental transformation driven by environmental regulation, stakeholder expectations for transparency, and an expanding commercial use of emissions-related data. Mandatory reporting of verified emissions data has increased significantly in recent years. Although reporting schemes differ in scope and methodology, they depend on similar underlying vessel operational data.

Operational information relevant to emission reporting is distributed across multiple onboard and shore sources. Depending on ship type, trade pattern and operational profile, relevant data may originate from noon reports and log abstracts, bunker delivery notes and fuel accounting, voyage and port-call timestamps, IMO-SEEMP-related records, notices of arrival and departure, oil record books, and other operational systems. Much of this information is common across regimes, yet it is captured and exchanged using unharmonised formats and organisation-specific interpretations.

In parallel, commercial use of emissions-related data is increasing through charter-party clauses, carbon cost allocation and settlement, pooling mechanisms and platform-based exchanges. This creates demand for more frequent and more granular reporting than traditional annual compliance submissions, and it increases the number of stakeholders who need to interpret the same operational reality consistently.

2. The problem: fragmentation, repeated transformation and inconsistent outcomes

Typically, shipping companies and their software partners record operational data points for various purposes using their own formats and internal definitions. When the same data must be shared with accredited verifiers, classification societies, charterers or commercial platforms, it must be adapted to fit recipient templates and validation rules. In many cases, crews, shipowners, operators and charterers are obliged to fill gaps between what is recorded and what a counterparty requires.

Repeated mapping and transformation introduces cost and a risk of losing quality of the data. Each additional step increases the likelihood of error, particularly where adjustments are manual, where units and time references differ, or where operational event definitions are ambiguous. Regulations and commercial mechanisms are not static; as requirements evolve, each new field or boundary rule multiplies integration work across the value chain.

A practical industry solution must therefore address interoperability across the various levels. The objective is not to standardise internal systems or prescribe calculation tools, but to standardise meaning, structure and exchange behaviour at the points where data is shared between stakeholders.

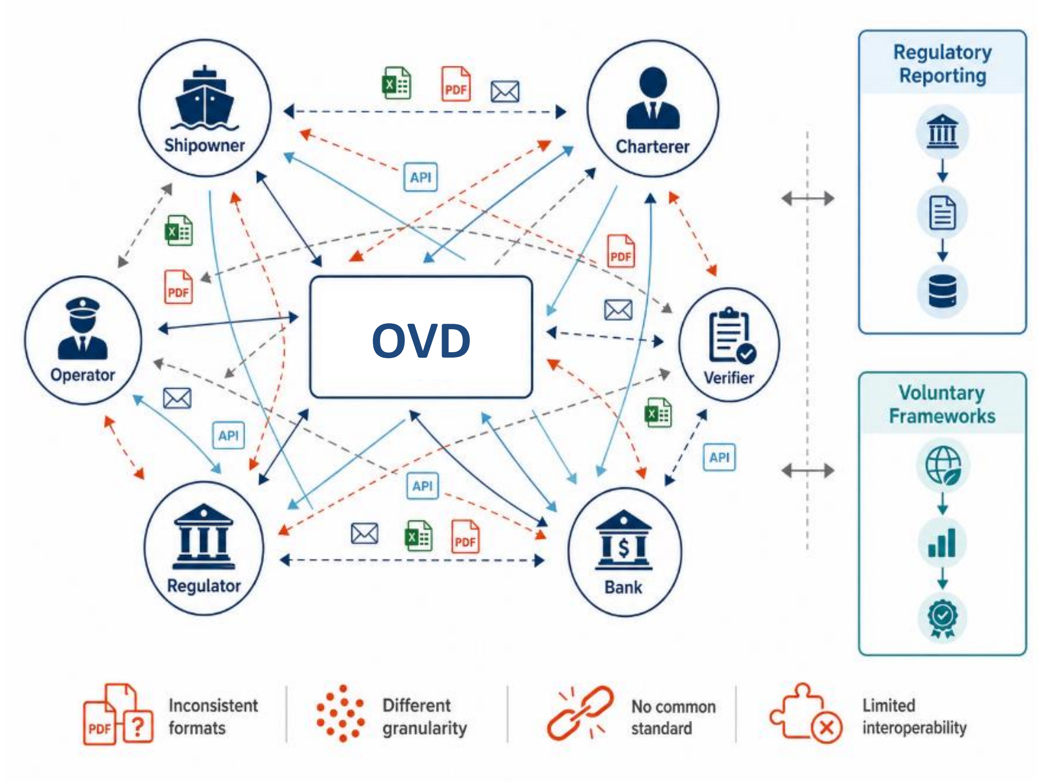

Figure 1. The emissions reporting ecosystem and the interoperability gap

3. Purpose, scope and design principles

This white paper proposes a harmonised framework centred on **Operational Vessel Data (OVD)** framework as a common exchange layer for emissions-relevant ship data. The primary objective is to establish shared definitions, structures, and formats for operational data so that it can be consistently understood and reused across systems, stakeholders, and reporting contexts. By standardising how operational data is described and exchanged, the framework aims to reduce fragmentation, improve data quality, and enable scalable digital solutions across the maritime value chain.

A central challenge addressed by this work is that operational data is today captured in different formats and interpreted differently by individual organisations. Even where the underlying data is similar, the absence of a common standard leads to repeated transformation, reconciliation, and risk of inconsistency when data is shared. A harmonised exchange layer provides a practical solution by enabling interoperability at the interface level, without requiring changes to onboard reporting practices or internal systems. This approach reflects the experience from existing OVD implementations, where a common structure allows data to be validated, reused, and applied across multiple use cases.

In considering the broader reporting landscape, emission-related use cases can be grouped into four categories reflecting different levels of maturity and standardisation. Mandatory regulatory reporting and established voluntary frameworks are already defined through regulation or methodology and are therefore largely outside the scope of this work. Internal ESG and ad hoc reporting remains too fragmented to be meaningfully standardised at present. The primary gap lies in commercial emissions reporting, where the lack of harmonised input data structures leads to inconsistencies in how results are derived and exchanged. Addressing this gap requires not only standardised outputs, but more fundamentally a consistent and reliable foundation of operational data being the input.

The guiding design principles are openness, software vendor neutrality and practical implementability. The JIWG framework focuses on standardising data structures and exchange behaviour while allowing organisations to retain their internal data models, systems and commercial arrangements. It preserves data ownership and control by defining structure and meaning, not access rights, storage location, or business logic. In line with established OVD practice, the aim is not to introduce new reporting requirements, but to enable consistent interpretation and reuse of data that is already collected, thereby supporting efficiency, interoperability, and digitalisation across the industry.

3.1 Industry initiative and role of Tripartite

The development of this framework is coordinated through the Tripartite Joint Industry Working Group (JIWG), which brings together key maritime stakeholders, including shipowners and managers, classification societies, and other industry participants with direct operational and technical expertise. The Tripartite collaboration reflects a long-standing industry practice of addressing cross-cutting technical challenges through cooperation between the operational, regulatory-supporting, and standard-setting parts of the maritime ecosystem.

The involvement of industry stakeholders is essential to ensure that the proposed framework is grounded in operational reality and aligned with existing regulatory structures and industry practices. Emissions-related data originates onboard and is managed across a diverse chain of actors, each with different roles, systems, and constraints. A solution that is developed “by the maritime industry, for the maritime industry” is therefore more likely to reflect practical implementation conditions, avoid unnecessary complexity, and gain broad acceptance across stakeholders.

Equally important, an industry-led approach supports neutrality and interoperability. By developing common structures and exchange principles collaboratively, the framework avoids dependence on any single commercial solution or proprietary model. This ensures that organisations of different sizes and levels of digital maturity can participate on equal terms, while enabling innovation and competition at the level of implementation rather than data structure. In this context, the Tripartite JIWG serves as a platform for convergence, facilitating alignment across existing initiatives and supporting the development of a common, stable foundation for emissions-relevant data exchange.

4. Definitions and terminology

Operational Vessel Data (OVD): A structured dataset used as an exchange layer for operational ship data relevant to emissions reporting, such as log abstracts and noon report extracts. OVD defines common meaning, structure, units and formats for exchange. It does not prescribe onboard data collection tools or internal databases.

Vessel Emission Report (VER): A structured output report containing aggregated operational and emissions-related information for a defined reporting boundary, such as a voyage, leg or reporting period. A VER includes calculated metrics and includes an explicit statement of assurance status.

Assurance status: A declaration of the level of assurance applied to a report. Examples include third-party verified, second-party reviewed or self-declared. The framework requires the assurance status to be explicit, but it does not mandate a particular assurance model.

Reporting boundary: The defined scope over which a dataset is aggregated, such as a voyage leg, contractual voyage or calendar period. Clear boundary definitions are critical for comparability and reconciliation.

Interface interoperability: An approach where parties keep internal systems but exchange information using shared structures and shared definitions at defined interfaces. Interoperability is achieved by mapping to the shared exchange layer rather than by enforcing a single internal solution.

Syntactic and semantic validation: Syntactic validation checks whether a dataset conforms to an agreed schema; semantic validation checks whether values follow agreed meaning, units, permitted ranges and event definitions.

5. Operational Vessel Data (OVD): the foundation for harmonised exchange

The Tripartite JIWG identified Operational Vessel Data (OVD) framework to be the foundation for the harmonised approach, as being the most effective lever for addressing today's reporting friction. OVD has proven being a mature and practically adopted standard for the harmonised exchange of operational data relevant to emissions reporting. It is best understood as an exchange layer between systems by defining a common structure and shared meaning for data exported from those systems, enabling it to be reliably consumed by external parties such as verifiers, classification societies, commercial platforms, and contractual counterparties.

In reviewing existing initiatives, the JIWG recognised that several organisations and software providers have already developed frameworks for the digital exchange of operational and emissions-relevant data. However, only a limited number were considered sufficiently mature for broader adoption to form a reliable basis for industry convergence. Among these, DNV's

Operational Vessel Data (OVD) standard was identified as a strong candidate, reflecting its existing practical deployment across a wide range of stakeholders and its alignment with emissions-related data requirements.

It was very important to the JIWG, that its purpose and scope were not to introduce a new concept, but to consolidate, refine, and extend an approach that is already functioning in practice, ensuring that it remains robust, interoperable and applicable across the wider industry.

The challenges addressed by this initiative are encountered across daily operations in the industry. Ship operators, managers, verifiers, and service providers routinely devote significant effort to mapping, transforming, and validating operational data that is largely similar in content but differs in structure, terminology, and format. These inconsistencies create inefficiencies, increase the risk of misinterpretation, and limit the scalability of digital solutions.

For organisations not currently using OVD-based structures, and for owners and operators who have not implemented the OVD, adoption does not require changes to existing onboard reporting practices or internal data models. In most cases, operational data can be mapped according to the IMO Compendium framework and to a common exchange structure at the interface level, which minimise implementation effort while enabling interoperability across systems and stakeholders.

At its core, the "OVD issue" is that identical operational situations are often represented differently across systems. Variations in event definitions, units, timestamp conventions, fuel identifiers, and boundary rules lead to different aggregation outcomes and, ultimately, different reported results. By standardising meaning and structure at the point of exchange, OVD reduces ambiguity, supports automated validation, and strengthens traceability across the reporting chain.

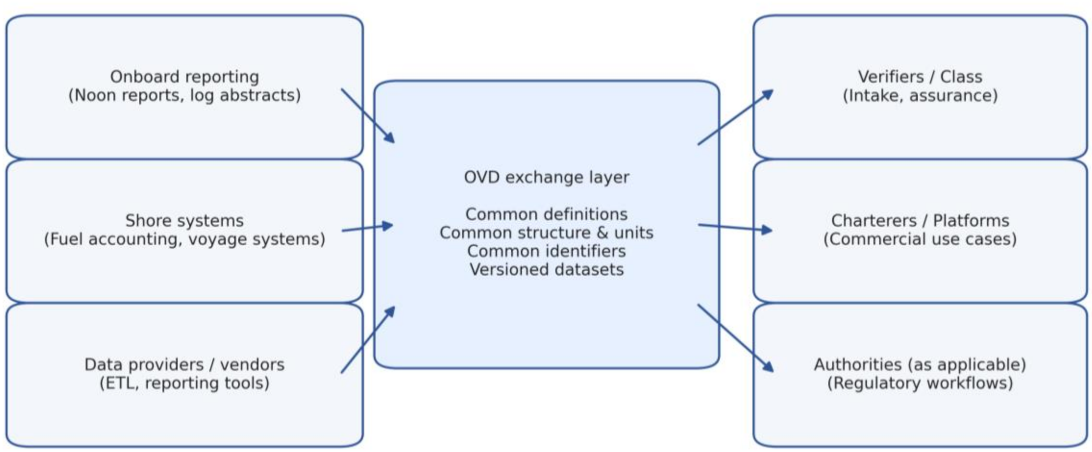

Figure 2. OVD as an exchange layer between onboard/fleet systems and external consumers

5.1 What OVD is, and what it is not

OVD is a structured, machine-readable dataset for exchange. It specifies data elements, naming, definitions and units, harmonised according to the IMO Compendium, as well as providing permitted structures, enabling consistent interpretation by receiving systems.

OVD however, does not define how data is collected onboard, which software must be used, or where data must be stored. It also does not prescribe regulatory logic, emission factors or commercial allocation rules. Those remain within applicable regulation, verifier methodology or contractual agreement.

This separation is deliberate. It allows stakeholders to innovate on tools and services while relying on a stable common exchange foundation. It also supports coexistence with other initiatives by focusing on interoperability rather than exclusivity.

5.2 Why OVD needs to be the primary focus

A standardised output report alone cannot resolve divergent outcomes if the underlying operational inputs are ambiguous. Interoperability must therefore begin with the operational exchange layer. Once operational data is exchanged in a harmonised structure, stakeholders can apply different calculation logic where required, while still achieving traceability and comparability because the inputs are consistent.

Standardisation and harmonisation does however not mean introducing new reporting requirements, mandating specific software solutions, or changing regulatory calculation methods. It means ensuring that existing operational ship data is described, structured and exchanged consistently across companies, systems and use cases.

Operational event terminology is a frequent source of inconsistency. Ship-to-ship operations may be labelled differently, and start and end criteria may vary. Milestones such as commencement of sea passage or arrival may be captured using different triggers. When boundaries are later used for aggregation, different triggers lead to different results.

Operational event terminology is a common source of inconsistency. Identical ship operations may be described using different terms, while the precise start and end criteria defining these events are critical. For instance, milestones such as End of Sea Passage (EOSP), Notice of Readiness (NOR), or arrival at berth may all refer to a vessel’s arrival at port. However, each of these triggers distinct processes and calculations, depending on regulatory definitions or commercial use cases.

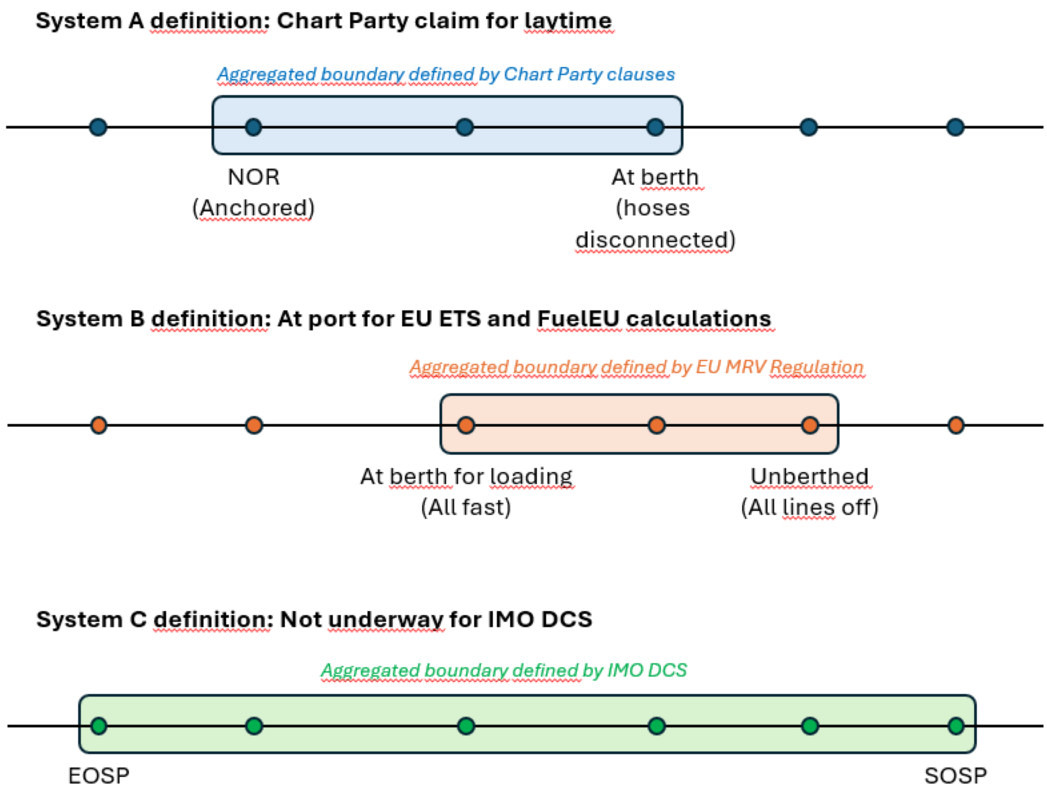

Figure 3. Examples of boundary and definition mismatches that drive divergent aggregation outcomes

Focusing on OVD also yields benefits beyond any single reporting output. The same operational exchange layer can support regulatory workflows, verification intake, commercial reporting and internal analytics. For implementers, this reduces the number of separate integrations needed and lowers the cost of accommodating future regulatory changes.

5.3 Granularity, aggregation and traceability

The framework does not impose a single level of granularity. OVD can support event-level reporting, voyage and leg aggregation, and period aggregation, depending on the use case. What matters is that receiving parties can interpret the dataset consistently and understand how aggregated values relate to underlying inputs.

Traceability is therefore a core design principle. Exchanged datasets should support linking aggregated figures back to underlying operational records and to the boundary definitions used. This supports reconciliation and enables efficient assurance workflows, particularly where multiple parties need to agree on the same operational boundaries for settlement.

5.4 Data control, neutrality and trust (OVD perspective)

Use of a harmonised exchange standard does not alter data ownership or commercial control. Data providers retain authority over what is shared, with whom and for which purpose. OVD defines structure and meaning, not access rights, storage location, commercial terms or business logic. It does not require a specific platform and does not create a centralised repository.

Trust and transparency are prerequisites for adoption. Clear definitions, published schemas, and predictable versioning enable implementers to adopt with confidence while respecting commercial sensitivity and contractual arrangements.

5.5 Examples of OVD content domains

To make the scope tangible, the table below gives an illustrative overview of content domains commonly exchanged for emissions-relevant reporting. It is not intended as a complete list; detailed data dictionaries belong in supporting technical specifications.

OVD domain	Examples of included information
Voyage and event metadata	Identifiers, voyage/leg boundaries, port call timestamps, operational events such as arrival/departure and STS operations.
Distance and time	Distance sailed by mode, time at sea, time in port, time at anchor, with explicit UTC handling and timezone references.
Fuel and energy use	Fuel consumption by fuel type, energy sources including shore power where applicable, and descriptors enabling consistent treatment of blends.
Operational context	Activity or operational mode indicators used for allocation and comparability, where available and applicable.
Supporting references	References to bunker delivery notes, log extracts, correction notes and evidence used for reconciliation and assurance workflows.

6. End-to-end exchange: business process and data exchange protocol

Standardised data elements are necessary but not sufficient to deliver interoperability. Stakeholders also need predictable exchange behaviours: when data is transmitted, how versions are handled, how validation feedback is communicated, and how corrections are reconciled. The JIWG therefore describes a business process and an associated exchange protocol that sits around OVD.

In a typical workflow, operational data is collected onboard or in fleet systems, exported in the OVD structure, transmitted to receiving parties, validated against syntactic and semantic rules, and reconciled where discrepancies exist between sources. Corrections may trigger re-issuance of datasets with clear versioning. Downstream actors can then apply their own calculation logic and assurance activities while relying on consistent input structures.

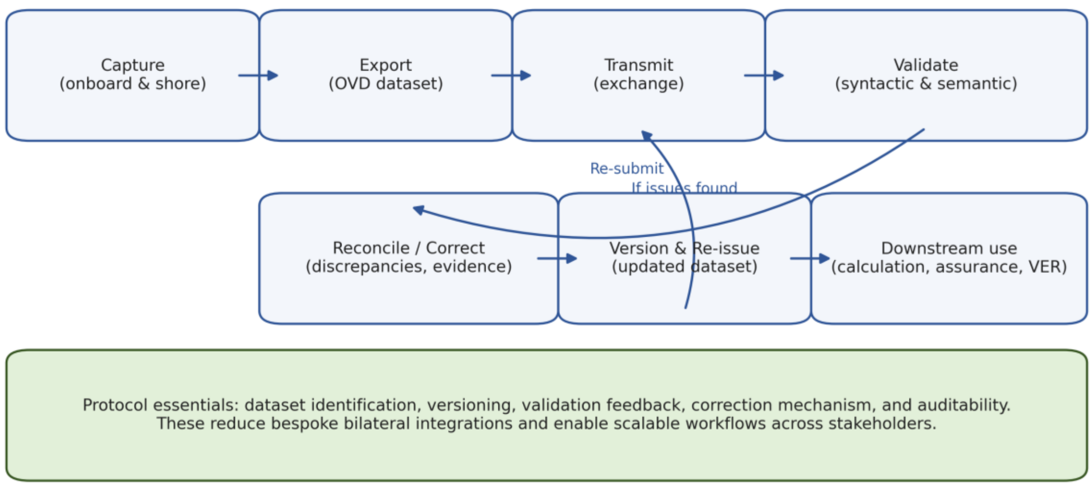

Figure 4. End-to-end workflow for emissions-relevant operational data

6.1 Protocol elements that enable scalability

To reduce bilateral 'hand-crafted' integrations, the exchange protocol should specify a limited but robust set of behaviours that can be implemented consistently. These behaviours include dataset identification and versioning, validation rules, correction mechanisms and auditability.

Dataset identification enables parties to refer to the same dataset unambiguously. Versioning enables a corrected dataset to supersede a previous dataset without losing traceability. Validation enables automated feedback where a dataset is structurally invalid or where values conflict with agreed meaning and units. Correction mechanisms define how a sender responds to validation feedback and how receiving parties handle updated datasets. Auditability enables assurance providers to understand the evolution of a dataset and the evidence supporting reported values.

Validation should distinguish between syntactic conformance and semantic consistency. Syntactic conformance checks whether the dataset matches the agreed schema. Semantic consistency checks whether values follow agreed meaning, units, permitted ranges and event definitions. Where semantic checks identify potential ambiguity, feedback loops should point to the relevant data element and definition, enabling rapid correction.

Reconciliation is required where operational records exist in multiple places, such as onboard logs and shore fuel accounting. Consistent identifiers, timestamps and supporting references reduce reconciliation effort. The protocol should support the inclusion of references to supporting documents and correction notes, enabling parties to explain and justify adjustments without resorting to ad hoc narrative emails.

7. Vessel Emission Reports (VER): standardised commercial reporting outputs (supporting role)

While the primary focus of this white paper is the OVD exchange layer, commercial stakeholders also benefit from consistent output structures for reporting and settlement. The framework therefore defines Vessel Emission Reports (VER) as standardised outputs summarising emissions-relevant performance over a defined boundary.

VER sits downstream of operational data capture and downstream of calculation and assurance activities. This separation clarifies three concerns that are often mixed in practice: operational inputs (what happened), processing and calculation (how outputs are derived), and reporting outputs (what is communicated and exchanged).

To support transparency, a VER includes explicit boundary definitions and an explicit statement of assurance status. A VER can be exchanged as third-party verified, second-party reviewed or self-declared depending on commercial context. The framework standardises how these aspects are communicated, without prescribing verification requirements or report layouts.

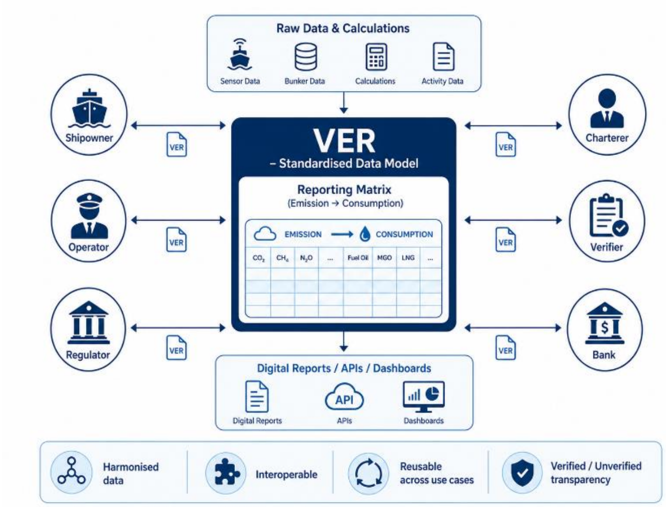

Figure 5. VER concept and reporting matrix

7.1 Keeping VER aligned with OVD

A VER should be traceable back to the OVD dataset(s) on which it is based. Where a VER aggregates multiple operational datasets or applies specific allocation logic, the report should retain references to the underlying OVD dataset identifiers and boundary rules. This supports reconciliation and helps counterparties understand differences between otherwise similar reports.

Because commercial use cases evolve rapidly, the VER structure should remain minimal and stable, relying on extensibility mechanisms and clear boundary definitions rather than proliferating bespoke formats.

The Tripartite JIWG will also issue a White Paper directly targeting the VER structure.

8. Implementation considerations and adoption pathway

Adoption is intended to be incremental and practical. The framework does not require changes to onboard reporting routines. The emphasis is on export and exchange at defined interfaces. Organisations can implement OVD mapping within existing fleet systems, through vendor solutions, or via platform-based exchange, provided that the exchanged dataset conforms to the agreed structure and protocol.

A recommended pathway begins with a pilot focusing on high-value elements that frequently cause rework, such as voyage and event timestamps, distance and time measures, and fuel and energy reporting with consistent identifiers. As operational experience grows, additional event types, supporting references and optional elements can be added. Implementers should prioritise automated validation and clear feedback loops early, as these deliver rapid efficiency gains.

8.1 Implications for companies not currently using OVD

Participation does not imply replacing existing onboard or shore systems. In most cases, organisations can map or export existing data to the common structure without changing how data is collected internally. The emphasis is interoperability at the interface, not mandating a specific internal data model or platform.

A practical mapping approach starts with identifying the operational data already collected (for example noon report extracts, bunker and fuel accounting, and voyage events), then mapping those elements to the OVD structure with explicit unit conventions and time reference handling. Where operational definitions differ, the mapping exercise provides a structured way to identify and resolve ambiguity.

8.2 Practical mapping steps (non-prescriptive)

A practical mapping exercise typically includes identifying current data sources and owners, defining how each operational event is currently recorded, mapping each element to the OVD definition and unit convention, and documenting any assumptions made. Where multiple internal sources exist for the same element, the mapping should define the authoritative source and the reconciliation approach.

Where organisations use multiple vendors or systems, the mapping approach provides a neutral ‘contract’ at the interface, reducing bespoke integration work. Over time, mapping can be simplified as internal systems converge on the shared definitions.

8.3 Change management and backward compatibility

Regulatory change is inevitable, and operational technologies evolve. A stable exchange layer must therefore support controlled evolution. The governance model should provide published versions of schemas and definitions, clear deprecation policies and migration guidance. Backward compatibility should be prioritised where feasible, so that implementers are not forced into disruptive, fleet-wide system changes.

Conformance criteria and reference examples support consistent interpretation across implementers. Conformance testing—whether through self-assessment checklists, sample datasets or automated validators—reduces ambiguity and accelerates adoption.

9. Governance and future development

The long-term value of a harmonised data exchange framework depends not only on its technical design, but also on the governance model that supports its evolution, implementation, and consistent interpretation across the industry. While the technical elements of the OVD framework described in this paper are already being developed and piloted, the governance arrangements under which they will be maintained and further refined remain subject to ongoing discussion within the Tripartite JIWG and among wider industry stakeholders.

Establishing an appropriate governance model is essential to ensure that the framework remains stable, transparent, and trusted over time. This includes defining how updates to data definitions, schemas, and exchange protocols are proposed, reviewed, agreed, and communicated. It also includes consideration of version management, backward compatibility, and the provision of guidance to support consistent implementation across organisations.

Governance plays a critical role in enabling industry adoption. While technical specifications define what data is exchanged and how, governance provides the framework within which those specifications can be applied consistently in practice. A clear and transparent governance model reduces uncertainty for implementers by ensuring that data structures, definitions, and exchange protocols remain stable over time, and that any changes are managed in a predictable and controlled manner. This minimises the risk of repeated reimplementation and supports long-term investment in integration and digitalisation.

In addition, governance supports consistent interpretation across stakeholders. Without common guidance, different organisations may interpret definitions, boundaries, or data elements in slightly different ways, reintroducing inconsistencies in otherwise harmonised data structures. By providing reference material, clarification mechanisms, and shared understanding, governance helps ensure that identical operational situations are represented consistently across the industry.

Governance also enables scalability. A framework intended for broad adoption must accommodate organisations of different sizes, technical maturity, and operational profiles. By incorporating feedback from practical implementation and allowing for iterative refinement, governance supports a gradual and inclusive adoption process. This lowers barriers to entry and enables a wider set of stakeholders to participate in, and benefit from, the framework.

At the same time, governance must reflect the principles underpinning this initiative, including openness, vendor neutrality, and broad accessibility. The framework should not impose barriers to entry or create dependencies on specific technologies or platforms. Instead, governance arrangements should enable participation from a wide range of stakeholders, ensure that operational experience is fed back into the development process, and support alignment with relevant international standards and regulatory developments.

As the framework matures, further work will be required to define conformance approaches, including how adherence to agreed data structures and exchange principles can be assessed in practice. However, it is important to emphasise that governance should support adoption rather than constrain it. The objective is to provide sufficient clarity and consistency to enable interoperability, while maintaining flexibility to accommodate different implementation approaches and evolving regulatory requirements.

The Tripartite JIWG will continue to engage with industry stakeholders to refine these governance elements, with a view to establishing a balanced model that ensures both stability and adaptability. A clear and credible governance structure will be a key enabler for widespread industry uptake and for the long-term success of the initiative.

10. Data control, neutrality and trust

Participation in a harmonised exchange framework does not alter data ownership or control. Data providers retain authority over what is shared, with whom and for which purpose. The standard defines structure and meaning, not access rights, storage location, commercial terms or business logic. The framework does not require use of any specific platform and does not create a centralised repository.

Trust is a prerequisite for adoption. Transparent boundary definitions and consistent exchange structures reduce disputes and clarify accountability. For commercial contexts, explicit assurance status in output reports provides a clear basis for using a report for settlement without assuming verification where it has not occurred.

11. Benefits and expected impact

A harmonised OVD-based exchange layer can reduce duplicated effort across the value chain and improve comparability of emission-relevant data. Benefits accrue to multiple stakeholder groups.

For shipowners and managers, a common exchange structure reduces manual transformation work, shortens reporting cycles and improves consistency of outputs across counterparties. It also provides a stable foundation for internal analytics and digitalisation without requiring replacement of existing onboard routines.

For verifiers and class societies, consistent intake structures improve data quality, reduce clarification cycles and support scalable workflows. Where evidence references and version histories are included, assurance activities can focus on substantive checks rather than format reconciliation.

For charterers, banks and other commercial counterparties, consistent operational boundaries and explicit assurance status improve trust in voyage- or contract-level reporting and reduce disputes during settlement.

For software providers and platforms, a vendor-neutral interface reduces bespoke integrations and enables scalable products. A shared exchange layer supports innovation by allowing differentiation on value-adding services rather than on proprietary data formats.

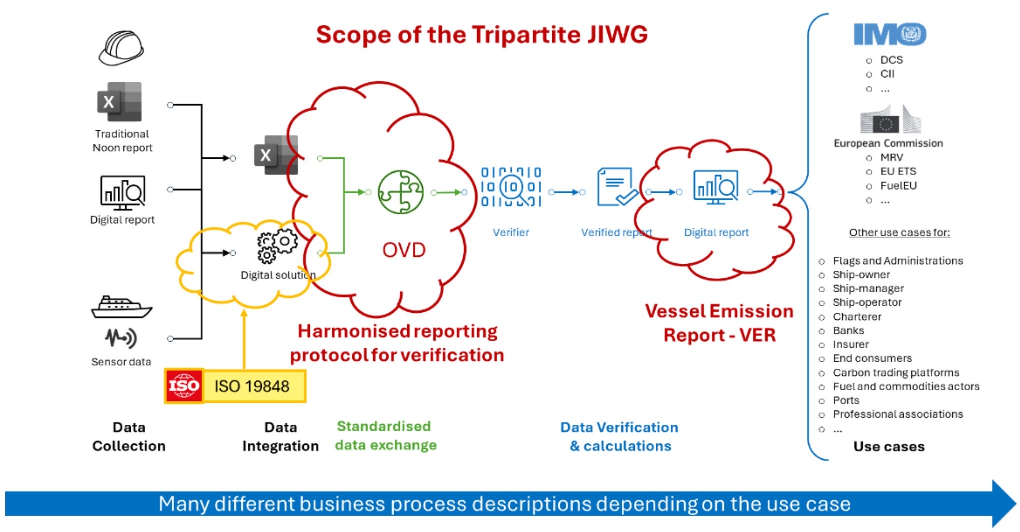

Figure 6. Scope of the Tripartite JIWG, highlighting OVD as the common exchange layer.

12. Next steps and conclusion

Commercial and regulatory emissions reporting will continue to expand in scope and complexity. Without harmonised exchange structures, reporting will remain burdened by repeated mapping, bilateral integrations and inconsistent interpretation of the same operational reality.

The Tripartite JIWG invites the maritime industry to engage in continued refinement and adoption of the common framework. The priority is broad uptake of OVD-based exchange for emissions-relevant operational data, supported by practical protocol guidance, conformance criteria and transparent governance. Pilots and implementation feedback should be used to clarify definitions, strengthen guidance and ensure the framework remains grounded in operational reality.

By converging on a stable, software vendor-neutral exchange layer, the maritime industry, owners and operators can reduce cost, improve data quality and enable scalable digital reporting across multiple regimes and commercial use cases, while allowing stakeholders to retain their internal systems and innovate on value-adding services.