

ESPR, Digital Product Passports and PPWR for Lubricants

Strategic implications, data architecture, packaging compliance and readiness roadmap for the lubricants sector

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CORE THESIS

For lubricant companies, ESPR, DPP and PPWR should not be managed as three separate compliance projects. They form one integrated product and packaging transparency agenda. The strategic challenge is to connect formulation chemistry, sustainability metrics, supply-chain evidence, packaging data and digital product information into a governed business capability.

Legal note: This white paper is intended for strategic orientation and does not constitute legal advice. Detailed obligations depend on regulatory texts, delegated acts, product scope, packaging configurations, customer requirements, national enforcement practice and company-specific facts.

Table of Contents

1. Executive Summary
2. Why the Lubricants Sector Should Act Now
3. Regulatory Architecture: ESPR, DPP and PPWR
4. Lubricants as Complex Chemical Products
5. Digital Product Passport Readiness for Lubricants
6. PPWR Implications for Lubricant Packaging
7. Integrated Data and Governance Model
8. Business Implications and Risk Areas
9. Technical File and Evidence Architecture
10. Readiness Roadmap
11. Board-Level Priorities
12. Outlook and Conclusion

References

1. Executive Summary

The European Union is moving from product compliance as a legal threshold toward product sustainability, circularity and transparency as market-entry conditions. The Ecodesign for Sustainable Products Regulation (ESPR), Regulation (EU) 2024/1781, establishes a framework for setting eco-design requirements for sustainable products and provides the legal basis for Digital Product Passports. The Packaging and Packaging Waste Regulation (PPWR), Regulation (EU) 2025/40, establishes lifecycle requirements for packaging and packaging waste across the EU market. [1][3]

Lubricants are not among the first product groups addressed by ESPR implementing measures, but current policy developments indicate increasing expectations regarding product sustainability and transparency on

sustainability attributes, environmental performance, circularity, packaging, and supply-chain traceability. The DPP creates the digital infrastructure logic for making such information accessible and interoperable. [1][2]

EXECUTIVE INSIGHT

The largest readiness gap for lubricant companies is unlikely to be knowledge of the regulation alone. It is usually fragmented data: formulation information in one system, SDS and regulatory data in another, supplier evidence in spreadsheets, LCA data in specialist tools, and packaging data in procurement or packaging development systems.

This white paper reframes ESPR, DPP and PPWR as an integrated transformation agenda for the lubricants sector. It outlines how lubricant companies can prepare for future requirements while creating strategic value through product innovation, circularity, measurable sustainability performance and stronger digital product governance.

2. Why the Lubricants Sector Should Act Now

Lubricants are performance-critical chemical products used in automotive, industrial, marine, energy, metalworking and specialty applications. Their value proposition has traditionally been based on equipment protection, efficiency, durability, reliability and OEM or customer approval. ESPR and DPP developments add a new dimension: the ability to document and communicate sustainability and lifecycle performance with the same rigor as technical performance.

- OEMs and industrial customers are increasingly requesting carbon, circularity and traceability data for supplied materials.
- Product innovation decisions are increasingly linked to renewable or re-refined base oils, lower lifecycle emissions, energy efficiency gains and extended drain intervals.
- DPP-style data models will require product-level information that is structured, controlled, and capable of being shared across the value chain.
- PPWR will require lubricant companies to assess and document packaging formats such as bottles, pails, drums, IBCs, closures, labels, shrink wrap, pallets and transport packaging.

STRATEGIC MESSAGE

Early preparation reduces regulatory risk, but the greater opportunity is competitive differentiation: lubricants that combine proven performance with credible sustainability data and compliant packaging will be better positioned with customers and procurement functions.

3. Regulatory Architecture: ESPR, DPP and PPWR

REGULATORY PILLAR	WHAT IT CHANGES	RELEVANCE FOR LUBRICANTS
ESPR	Creates the EU framework for product sustainability requirements, including performance and information requirements through product-specific delegated acts. [1]	Future lubricant-related obligations may focus on sustainability data, substances of concern, circularity, environmental footprint and transparency.
Digital Product Passport	Provides a digital identity card for products, components and materials and supports reliable product information across the lifecycle. The European Commission states that DPPs will be introduced progressively across selected product groups. [2]	Lubricants may need structured digital data on composition, regulatory status, carbon footprint, circularity, traceability and end-of-life handling.
PPWR	Establishes harmonized lifecycle requirements for packaging placed on the EU market, including waste prevention, recyclability, reuse, recycled content and documentation. [3]	Covers lubricant packaging such as HDPE bottles, caps, labels, pails, steel drums, plastic drums, IBCs, corrugated boxes and pallet wrapping.

4. Lubricants as Complex Chemical Products

Lubricants are not simple articles. They are complex chemical formulations with base oils, additive packages, performance enhancers and, increasingly, renewable or recycled feedstocks. This creates a particular ESPR challenge: sustainability requirements cannot be assessed only at the external product level. They must be connected to formulation chemistry, application performance, safety classifications, regulatory status, lifecycle data and supply-chain transparency.

CHARACTERISTIC	WHY IT MATTERS	READINESS IMPLICATION
Complex formulations	Multiple ingredients can have different regulatory, hazard, performance and sustainability profiles.	Build product-level and component-level data governance.
Performance dependency	Sustainability changes must not compromise OEM approvals, drain intervals, wear protection or operational reliability.	Integrate regulatory and sustainability criteria into R&D stage gates.
Circularity options	Re-refined base oils, used-oil collection and circular service models may support sustainability objectives.	Assess technical feasibility, customer acceptance and claims substantiation.
Data sensitivity	Formulation information is commercially sensitive but DPP models require transparency and access control.	Define public, customer, regulator and confidential-data layers.

5. Digital Product Passport Readiness for Lubricants

where required by future delegated acts or other applicable Union legislation

The Digital Product Passport should be understood less as a single IT tool and more as a governed product-data ecosystem. The European Commission describes the DPP as a digital identity card for products, components and materials, intended to store relevant information that supports sustainability, circularity and legal compliance. [2]

DATA DOMAIN	ILLUSTRATIVE LUBRICANT DATA	SOURCE SYSTEMS	GOVERNANCE QUESTION
Product identity	Product name, SKU, use/application, market, variant, packaging unit	ERP, PLM, PIM	Who owns master data quality?
Chemical and regulatory	SDS reference, REACH/CLP status, substances of concern, restrictions	SDS tools, regulatory databases	How is confidential formulation protected?
Sustainability	PCF, LCA results, energy efficiency contribution, bio-based or re-refined content	LCA tools, sustainability systems	How are methods and assumptions validated?
Circularity	Recoverability, used-oil collection, re-refined content, end-of-life guidance	Product stewardship, customer programs	How is circularity evidenced?
Supply chain	Supplier origin, certifications, traceability, supplier CO2 data	Supplier portals, procurement	What data is mandatory from suppliers?
Packaging	Packaging material, recyclability, recycled content, PPWR technical file status	Packaging BOM, supplier declarations	How does packaging data connect to product data?

BOARD TAKEAWAY

The DPP Registry is not the strategic endpoint. The strategic challenge is building an auditable data ecosystem that can reliably feed product passports, customer disclosures, sustainability reports, compliance files and market-surveillance responses.

6. PPWR Implications for Lubricant Packaging

PPWR applies to packaging placed on the EU market and is relevant to lubricant packaging regardless of whether the lubricant is automotive, industrial, marine or specialty. Lubricant companies must therefore assess both product and packaging compliance streams. A package can be suitable for transport or chemical hazard communication purposes and still require PPWR assessment for recyclability, minimisation, recycled content, labelling and documentation. [3]

PACKAGING FAMILY	EXAMPLES	PRIMARY PPWR ASSESSMENT FOCUS
Primary retail packaging	1L, 4L and 5L HDPE bottles, closures, sleeves, labels	Recyclability, recycled content, material compatibility, labelling
Industrial containers	20L pails, plastic drums, steel drums, grease cartridges	Reuse potential, recyclability, material specification, supplier declarations
Bulk packaging	IBCs, returnable systems, large drums	Reuse loops, traceability, technical files, packaging optimization
Secondary packaging	Corrugated boxes, dividers, cartons, trays	Packaging minimisation, recyclability, recycled content evidence
Transport packaging	Stretch film, shrink wrap, pallets, pallet straps	Waste reduction, recycled content, reuse and logistics efficiency

7. Integrated Data and Governance Model

ESPR, DPP and PPWR require lubricant companies to connect data domains that have historically been managed separately. The target operating model should define ownership, quality controls, approval workflows and access levels for product, chemical, sustainability, supplier and packaging data.

FUNCTION	TYPICAL RESPONSIBILITY	DATA CONTRIBUTION	GOVERNANCE ROLE
Regulatory affairs	REACH, CLP, SDS, product restrictions	Compliance status, restricted substances, documentation	Defines legal interpretation and compliance evidence
R&D / formulation	Product design and performance validation	Formula attributes, test data, innovation roadmap	Ensures sustainability changes do not compromise performance
Sustainability	LCA, PCF, ESG metrics, circularity	Carbon footprint, circularity indicators, reporting metrics	Owns methodology and claim substantiation
Procurement	Supplier engagement and sourcing	Supplier declarations, origins, certificates	Embeds data obligations in supplier governance
Packaging	Packaging BOM, specifications, design	Material composition, recyclability, recycled content	Owns PPWR technical file inputs
IT / data	Systems and integration architecture	APIs, data model, data quality, access controls	Enables scalable DPP and reporting architecture

8. Business Implications and Risk Areas

Data fragmentation

If product, SDS, LCA, supplier and packaging data remain disconnected, DPP and PPWR readiness will be slow, costly and difficult to audit.

Unvalidated sustainability claims

Claims relating to carbon reduction, bio-based content, re-refined content or circularity must be supported by reliable methods and evidence.

Packaging blind spots

Lubricant businesses may focus on formulation and overlook packaging, even though PPWR creates extensive technical documentation and evidence requirements.

Supplier evidence gaps

A DPP-ready data model depends on upstream information regarding raw materials, sustainability performance, certifications and regulatory status.

Performance trade-offs

Sustainable formulation changes must preserve lubricant performance, OEM approvals, product stability, safety classification and customer expectations.

9. Technical File and Evidence Architecture

A practical readiness approach is to build technical files and evidence matrices that can support both regulatory compliance and customer-facing disclosures. For packaging, this should be managed at packaging-family level, for example HDPE bottles, plastic pails, steel drums, plastic drums, IBCs and transport packaging.

EVIDENCE AREA	TYPICAL CONTENT	OWNER
Product identification	Product name, SKU, applications, markets, version history	Product management / PLM
Regulatory file	SDS, REACH/CLP status, restrictions, substance review	Regulatory affairs
Sustainability file	PCF, LCA assumptions, renewable/re-refined content evidence, methodology	Sustainability / product stewardship
Supplier evidence	Supplier declarations, certificates, raw material data, chain-of-custody evidence	Procurement
Packaging technical file	Packaging specification, material composition, recyclability, recycled content, supplier certificates, PPWR declaration	Packaging / regulatory
DPP publication layer	Public data, customer data, regulator data and restricted confidential data mapping	DPP governance team

BEST PRACTICE

Start with the top 10 products and top 10 packaging SKUs by EU volume. This creates a practical pilot scope that usually captures a significant share of business exposure while allowing the organization to test data ownership, evidence quality, supplier response and DPP readiness.

10. Readiness Roadmap

PHASE	OBJECTIVE	KEY ACTIVITIES	OUTPUTS
1. Discover	Understand exposure and maturity	Portfolio mapping, packaging mapping, system inventory, data gap review	ESPR/DPP/PPWR readiness heat map
2. Design	Define target model	DPP data model, governance roles, disclosure layers, PPWR file template	Target operating model and roadmap
3. Build	Create data and evidence capability	Supplier templates, data integration, technical files, LCA/PCF process	Pilot data architecture and evidence repository
4. Deploy	Scale across priority portfolio	Top SKU rollout, supplier onboarding, dashboard launch, packaging file completion	DPP-ready priority portfolio
5. Operate	Maintain continuous compliance	Change control, regulatory monitoring, supplier updates, periodic audits	Ongoing governance and compliance assurance

11. Board-Level Priorities

- Appoint executive sponsorship for an integrated ESPR, DPP and PPWR program.
 - Conduct readiness assessments across lubricant portfolios, packaging portfolios and data systems.
 - Define a Digital Product Passport data architecture before product-specific requirements are finalized.
 - Build PCF, LCA and circularity analytics into product and innovation governance.
 - Prioritize supplier traceability and evidence requirements in procurement contracts.
 - Create standardized PPWR technical files for priority packaging families.
 - Pilot a product sustainability dashboard for high-volume lubricant products.
 - Monitor delegated acts, DPP standards, registry developments and PPWR implementation timelines.
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12. Outlook and Conclusion

ESPR, DPP and PPWR mark a structural shift in EU product regulation. For lubricants, the shift is especially important because the sector combines complex chemistry, high performance requirements, sensitive formulation data, diverse packaging formats and increasing customer demand for sustainability evidence.

The companies best prepared for the next phase will not be those that wait for finalized lubricant-specific delegated acts. They will be those that start building the required capabilities now: governed product data, credible sustainability metrics, traceable supplier evidence, packaging technical files, and digital interfaces capable of supporting future DPP requirements.

FINAL MESSAGE

The future lubricant product will be assessed not only by how well it performs, but also by how transparently it can demonstrate sustainability, circularity, compliance and responsible value-chain management.

References

- [1] Regulation (EU) 2024/1781 establishing a framework for the setting of ecodesign requirements for sustainable products. <https://eur-lex.europa.eu/eli/reg/2024/1781/oj/eng>
 - [2] European Commission, Digital Product Passport. https://single-market-economy.ec.europa.eu/single-market/digital-product-passport_en
 - [3] Regulation (EU) 2025/40 on packaging and packaging waste. <https://eur-lex.europa.eu/eli/reg/2025/40/oj/eng>
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