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Toolkit Zone 3 Practical Modules

Green Logistics & Mobility

Green and Circular Economy in Business by
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Chapter 15 - Green Logistics and Mobility for SMEs

Transport and logistics decisions shape a large share of an SME's climate footprint and operating costs. They also influence reliability, customer satisfaction, and exposure to disruption (fuel price volatility, congestion, extreme weather, new urban access rules). Across Europe, transport emissions remain a major challenge, with road transport dominating the sector's emissions profile, which makes logistics a high impact area for practical action (European Environment Agency, 2025).

For SMEs, "green logistics" is best understood as improving how goods move and how mobility is organised so that the same service is delivered with less energy, fewer emissions, and lower waste. The strongest results typically come from a sequence of actions: measure what matters, reduce unnecessary kilometres and empty running, increase vehicle and load efficiency, then shift to lower carbon fuels and modes where feasible. Evidence from empirical research shows that green logistics practices are associated with stronger sustainability performance and can support competitiveness when implemented systematically rather than as isolated initiatives (Jayarathna et al., 2024; Agyabeng-Mensah & Tang, 2021).

15.1 Where emissions and costs usually sit

Most SMEs find that logistics emissions concentrate in a few predictable places:

1. Vehicle kilometres and empty running
Unplanned routing, fragmented deliveries, and low backhaul utilisation increase both cost per delivery and emissions per unit.
2. Load and packaging inefficiency
Poor palletisation, oversized packaging, low fill rates, and product damage create avoidable transport volume and returns.
3. Urban delivery constraints
Congestion, limited delivery windows, and access restrictions raise idling time and reduce productivity.
4. Warehousing and handling
Energy use for lighting, heating, refrigeration, and material handling equipment adds a secondary but relevant footprint.

A practical implication is that route planning and load management often deliver the fastest payback, while vehicle replacement and alternative fuels usually require longer time horizons and financing.

15.2 Green logistics practices that reliably improve sustainability performance

Research linking green logistics to sustainability performance highlights that results come from a bundle of practices rather than a single “silver bullet”. Jayarathna et al. (2024) find that green logistics practices relate to sustainability performance through three interrelated categories: logistics capabilities, resource related practices, and people related practices. They also emphasise that these elements interact in nonlinear ways, which is a strong argument for a whole system approach rather than one off actions.

Logistics capabilities

These are the operational and organisational capabilities that reduce waste in movement and handling, such as:

- Route optimisation and delivery planning (consolidation, time windows, dynamic re routing)
- Collaboration with customers and carriers (shared forecasts, flexible delivery slots, consolidated drops)
- Smarter network choices (micro hubs, cross docking, fewer split shipments)
- Data and visibility (basic traceability of shipments, delivery performance analytics)

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Resource related practices

These are the “technical” levers that reduce energy and emissions per kilometre or per tonne kilometre, including:

- Higher load factors and fewer empty runs (backhauls, shared transport)
- Eco driving and speed management
- Tyre management and preventive maintenance
- Lower carbon vehicles and fuels where feasible (for example electric vans for urban routes, biofuels or renewable fuels where compatible)
- Packaging reduction and damage prevention to cut returns

People related practices

A recurring finding in the literature is that skills, routines, and incentives determine whether technical measures actually work. Agyabeng-Mensah and Tang (2021) show that green human capital supports the adoption of green logistics practices, and that these practices link to improved competitiveness and, through that, better social and financial

performance. For SMEs, the practical message is simple: training and role clarity are not “soft extras”; they are enabling conditions for performance gains.

15.3 Route optimisation and delivery planning: the highest value starting point

For many SMEs, route optimisation is the fastest, least capital intensive way to cut emissions.

Actions with high SME feasibility:

- Consolidate deliveries and reduce split shipments. Combine orders into fewer drops, negotiate delivery windows, and avoid “next day by default” where customers accept alternatives.
- Reduce empty kilometres. Use backhauls, collaborate with nearby firms, or work with carriers that can pool freight.
- Improve stop planning and loading. Basic changes such as sequencing stops by geography, standardising loading plans, and reducing waiting times can deliver material savings.
- Use simple digital tools. Even lightweight route planning tools can reduce kilometres travelled, improve punctuality, and lower fuel consumption. The key is not sophisticated software, but consistent use and learning.

This is also where SMEs can create measurable KPIs quickly: kilometres per delivery, litres per 100 km, deliveries per route, failed delivery rate, and load utilisation.

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15.4 Green fleets and low carbon mobility choices

Fleet choices should match route profile, payload, and infrastructure availability.

Practical decision logic for SMEs:

- First, reduce demand for vehicle kilometres. If routing and consolidation reduce kilometres by 10–20%, the required fleet capacity may drop, improving the business case for later upgrades.
- Then, improve existing vehicles
 - preventive maintenance, tyre pressure management, and aerodynamic add ons where relevant
 - eco driving training and monitoring. These measures are usually low cost and can be implemented rapidly.
- Finally, plan fleet transition in phases. Urban and short range operations are often the most suitable entry point for electrification. Longer distance freight may require different pathways (vehicle renewal cycles, partner carriers, contractual

requirements, and fuel availability). SMEs that do not operate their own fleet can still influence emissions through contracting: setting expectations for vehicle standards, load factors, and reporting.

15.5 Greener logistics through supplier collaboration and traceability

Green logistics performance is rarely fully controllable by a single SME, especially when transport is outsourced. Collaboration therefore becomes a central lever.

Effective collaboration practices include:

- joint problem solving on packaging, pallet configuration, and return reduction
- shared forecasting to reduce urgent shipments and partial loads
- agreed KPIs and simple reporting cycles with logistics providers
- coordination of delivery slots and unloading processes to reduce idling and waiting time

Empirical research supports the idea that green performance improves when firms build capabilities for coordination and learning rather than relying only on compliance checklists (Jayarathna et al., 2024; Agyabeng-Mensah & Tang, 2021). For SMEs, this means focusing on a small number of high impact partners and building practical “working agreements” around data, routines, and targets.

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15.6 Measuring logistics emissions in a credible and proportionate way

Measurement is increasingly requested by customers and is also necessary for internal prioritisation. A practical approach is to track logistics emissions at shipment or route level, using recognised methods.

Two widely used references are:

- ISO 14083, which provides a method for quantification and reporting of greenhouse gas emissions arising from transport chain operations (CLECAT, 2024).
- The GLEC Framework, which offers an accessible approach to calculate and report logistics emissions and aligns with ISO 14083 methodologies (Smart Freight Centre, 2023).

For SMEs, the goal is not perfect data from day one. A credible start often looks like:

- define the boundary: own fleet and key outsourced transport legs
- collect basic activity data: fuel use, kilometres, payload estimates, shipment counts
- use consistent emission factors and document assumptions

- improve data quality over time (better load data, more precise distances, fewer estimates)

A simple but effective KPI set:

- total logistics emissions (tCO₂e) and emissions intensity (per delivery, per tonne, or per euro of revenue)
- kilometres travelled and empty running share
- average load factor or fill rate
- failed deliveries and returns rate
- fuel consumption per kilometre (for own fleet) or carrier reported intensity (for outsourced)

15.7 A compact implementation roadmap for SME managers

Step 1: Baseline and hotspots (2–4 weeks)

Map transport flows, top routes, key carriers, and the main cost and emissions drivers.

Step 2: Quick wins (1–3 months)

Consolidation, routing discipline, load planning, eco driving, maintenance routines, packaging fixes.

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Step 3: Supplier and customer alignment (3–6 months)

Negotiate delivery windows, build shared KPIs with carriers, address waiting time and returns drivers, start basic traceability for high impact products.

Step 4: Fleet and modal strategy (6–24 months)

Plan vehicle renewal or carrier requirements, explore low emission options for the routes where they fit, and integrate logistics into broader sustainability reporting needs.

Step 5: Continuous improvement

Review KPIs quarterly, update targets, and treat logistics as an operational excellence area where cost control and decarbonisation reinforce each other.

This approach reflects what the evidence suggests: sustainability performance improves when green logistics is treated as a system of capabilities, resources, and people, supported by measurement and learning, not as a checklist of isolated actions (Jayarathna et al., 2024; Agyabeng-Mensah & Tang, 2021).

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