Supplier Network & Data Integration Guide

For the Replit Development Agent

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1. Objective

This document provides a detailed technical guide for the Replit Agent to build a comprehensive, pre-vetted supplier network within the 'Drinks Sustainability Tool'. This system will allow clients to easily select existing suppliers and their products, streamlining the LCA data collection process. It also outlines the workflows for onboarding new suppliers, both through client invitations and direct sign-ups.

2. Part 1: Database Structure for the Supplier Network

To support this feature, we must extend our existing PostgreSQL schema.

2.1. New Table: verified_suppliers

This table will store the master list of all suppliers in our network.

Column Name	Data Type	Constraints	Description
id	UUID	PRIMARY KEY	Unique identifier for the verified supplier.
supplier_name	VARCHAR(255)	NOT NULL, UNIQUE	The official name of the supplier company.
supplier_category	VARCHAR(100)	NOT NULL	e.g., 'Bottle Producer', 'Label Maker', 'Contract Distillery'.
website	VARCHAR(255)		The supplier's official website.
contact_email	VARCHAR(255)		A general contact email for the supplier.
is_verified	BOOLEAN	NOT NULL, DEFAULT false	Status flag set to true by an admin once the supplier's data is vetted.

2.2. New Table: supplier_products

This table will store the specific products offered by verified suppliers. It is designed to hold either a pre-calculated LCA or the raw data needed to calculate one.

Column Name	Data Type	Constraints	Description
id	UUID	PRIMARY KEY	Unique identifier for the supplier product.
supplier_id	UUID	NOT NULL, FOREIGN KEY (verified_suppliers.id)	Links to the supplier that produces this product.
product_name	VARCHAR(255)	NOT NULL	The official name or SKU of the product.
product_description	TEXT		A brief description of the product.
has_precalculated_lca	BOOLEAN	NOT NULL, DEFAULT false	Flag to indicate if lca_data_json is populated.
lca_data_json	JSONB	NULLABLE	Stores the pre-calculated, verified LCA results if the supplier provides them.
product_attributes	JSONB	NULLABLE	Stores the raw data attributes if no pre-calculated LCA is available. See structure below.

Structure for product_attributes JSONB field:

This field will store different key-value pairs depending on the supplier_category.

- **For 'Bottle Producer':**
  - material_type: (String, e.g., 'Glass', 'PET', 'Aluminum')
  - weight_grams: (Numeric)
  - recycled_content_percentage: (Numeric, 0-100)

- ○ color: (String, e.g., 'Flint', 'Amber')
- **For 'Label Maker':**
  - ○ material_type: (String, e.g., 'Paper - Coated', 'Paper - Uncoated', 'Polypropylene')
  - ○ weight_grams_per_sq_meter: (Numeric)
  - ○ dimensions_mm: (String, e.g., '80x120')
  - ○ recycled_content_percentage: (Numeric, 0-100)
  - ○ adhesive_type: (String, e.g., 'Water-based', 'Solvent-based')
- **For 'Stopper/Closure Producer':**
  - ○ material_type: (String, e.g., 'Natural Cork', 'Aluminum', 'Plastic')
  - ○ weight_grams: (Numeric)
- **For 'Secondary Packaging Producer':**
  - ○ material_type: (String, e.g., 'Corrugated Cardboard', 'Paperboard')
  - ○ weight_grams: (Numeric)
  - ○ recycled_content_percentage: (Numeric, 0-100)

2.3. Modification to product_inputs Table

We need to add a column to link a client's input to a pre-vetted supplier product.

Column Name	Data Type	Constraints	Description
... (existing columns)			
supplier_product_id	UUID	FOREIGN KEY (supplier_products.id), NULLABLE	If the client selects a product from the network, this field links to it, overriding manual data entry.

3. Part 2: Client-Side Supplier & Product Selection

- **Workflow Logic Update:**
  - ○ When a client selects a product from the supplier network, the backend creates an entry in product_inputs linking to the supplier_product_id.
  - ○ During the final LCA calculation, the system will check the selected supplier_products entry:
    1. **If has_precalculated_lca is true:** The system will directly use the data from the lca_data_json field.
    2. **If has_precalculated_lca is false:** The system will use the raw data from the product_attributes field (e.g., material, weight) and calculate the impact

itself using the OpenLCA engine.

4. Part 3: New Supplier Onboarding (Admin/Internal Process)

- **Workflow Update:**
  - When an admin adds a new supplier product, they will be presented with a choice: "Does this product have a pre-calculated LCA/EPD?"
  - **If Yes:** The admin will upload the document and input the final LCA values into the lca_data_json field. has_precalculated_lca is set to true.
  - **If No:** The admin will be presented with a dynamic form based on the supplier's category to input the raw product attributes (weight, material, etc.) into the product_attributes field. has_precalculated_lca is set to false.

5. Part 4: Client-Initiated Supplier Invitation Flow

(No changes to this section. The logic remains the same.)

6. Part 5: The Supplier's Onboarding Journey

- **Workflow Update:**
  - During the supplier onboarding process, after providing company details, the supplier will be asked for each product: "Do you have a third-party verified Life Cycle Assessment (LCA) or Environmental Product Declaration (EPD) for this product?"
  - **If Yes:** They will be prompted to upload the official document and enter the final impact values (Carbon, Water, Waste). This data will populate the lca_data_json field and be flagged for admin verification.
  - **If No:** They will be guided through a form tailored to their supplier category to provide the raw product attributes (material, weight, recycled content, etc.). This data will populate the product_attributes field.
  - All submitted data, whether pre-calculated or raw, will be placed in a queue for an Avallen Solutions admin to review and verify before the supplier is made visible in the public network (is_verified = true).