Company Water Footprint 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 **Company Water Footprint Calculator and Visualizer**. This feature will enable clients to capture their total operational water usage and view a comprehensive breakdown of their entire water footprint, combining agricultural, processing, and operational data.

2. Part 1: Backend & Database Enhancements

2.1. Data Storage (company_data table)

- **Requirement:** We need to store the company's total operational water consumption. The existing company_data table is suitable for this.
- **Action:** The backend must be updated to handle a new data_type value:
  - operational_water_use

2.2. New API Endpoint

- **Endpoint:** POST /api/company/water
- **Request Body:** { "total_consumption_m3": 1500, "reporting_period": "..." }
- **Logic:** This endpoint will create a new record in the company_data table with the data_type set to operational_water_use and the value in cubic metres.

2.3. New Calculation Service Logic

- **Service:** WaterFootprintService
- **Function:** calculate_total_company_footprint(company_id)
- **Logic:** This new service function will perform the following calculation:
  1. **Calculate Total Product Water:**
     - Fetch all completed product LCAs for the company for the reporting period.
     - For each product, multiply its per-unit water footprint (which includes agricultural and processing water) by the total number of units produced.
     - Sum these values to get the total_product_water.
  2. **Fetch Operational Water:**
     - Fetch the operational_water_use value from the company_data table for the reporting period.
  3. **Return Total:** Return a JSON object with the breakdown: { "total": ...,

"product_water": ..., "operational_water": ... }.

3. Part 2: Frontend Data Collection

A new data entry section must be added to the **'Company' tab** of the application.

- **UI Section:** "Company Water Usage"
- **Headline:** "What is your facility's total water consumption?"
- **Form:**
  - **Field 1:** Total Water Consumption (Cubic Metres - m^3) (Numeric Input).
  - **Field 2:** Data Source (Optional) (File Upload for a water bill).
- **Guidance:** A prominent tooltip will explain: "Please enter the total water consumed at your production facilities for the reporting period, which you can find on your utility bills. This covers water for cleaning, cooling, sanitation, and other general operations. It does not include the water that goes directly into your product (dilution water), as that is calculated separately from your product data."
- **Action:** A "Save" button that calls the POST /api/company/water endpoint.

4. Part 3: Frontend Visualization

A new visual component must be added to the main **Dashboard** (/app/dashboard).

- **UI Component:** WaterFootprintBreakdownChart
- **Type:** A Pie Chart or a Donut Chart (using the Recharts library).
- **Data:** The chart will be populated by a new API endpoint, GET /api/company/water-footprint, which calls the WaterFootprintService.
- **Visual Breakdown:** The chart must clearly display the total company water footprint, with distinct, color-coded segments for:
  1. **Agricultural Water** (from the product LCAs)
  2. **Processing & Dilution Water** (from the product LCAs)
  3. **Operational Water** (from the new company_data entry)
- **Interactivity:** When a user hovers over a segment of the chart, a tooltip must appear showing the name of the category and its total volume in cubic metres (m^3).