```
<!DOCTYPE html>
<html lang="fr">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Comparateur 3 Scénarios Consommation & ROI Éclairage Garage</title>
    <script src="https://cdn.tailwindcss.com"></script>
    <script>
      tailwind.config = {
        theme: {
          extend: {
            fontFamily: {
              sans: ['Inter', 'sans-serif'],
            },
            colors: {
              primary: {
                DEFAULT: '#3b82f6', // blue-500
                light: '#dbeafe', // blue-100
                dark: '#1e40af' // blue-800
              },
              secondary: '#10b981', // emerald-500
              accent: '#f59e0b' // amber-500
            }
          }
        }
      }
    </script>
    <link rel="preconnect" href="https://fonts.googleapis.com">
    <link rel="preconnect" href="https://fonts.gstatic.com" crossorigin>
    <link href="https://fonts.googleapis.com/css2?
family=Inter:wght@400;500;600;700&display=swap" rel="stylesheet">
    <style>
        body {
            font-family: 'Inter', sans-serif;
            background-color: #f0f4f8;
        }
        .card {
            background-color: white;
            border-radius: 0.75rem;
            padding: 1.5rem;
            box-shadow: 0 4px 6px -1px rgb(0 0 0 / 0.07), 0 2px 4px -2px rgb(0 0 0 / 0.07);
            margin-bottom: 1.5rem;
            height: 100%; /* Pour aligner les cartes */
        }
        label {
            display: block;
            margin-bottom: 0.375rem;
            font-weight: 500;
            color: #4b5563;
            font-size: 0.875rem;
        }
        label.event-label {
             font-size: 0.75rem; /* text-xs */
             color: #6b7280; /* text-gray-500 */
        }
        input[type="number"] {
            width: 100%;
    padding: 0.5rem 0.75rem;
    border: 1px solid #d1d5db;
    border-radius: 0.375rem;
    margin-bottom: 1rem;
    box-shadow: inset 0 1px 2px 0 rgb(0 0 0 / 0.05);
    transition: border-color 0.2s ease-in-out, box-shadow 0.2s ease-in-out;
}
input[type="number"]:focus {
    outline: none;
    border-color: var(--tw-color-primary, #3b82f6);
    box-shadow: 0 0 0 3px var(--tw-color-primary-light, #dbeafe);
}
h2 {
    font-size: 1.5rem;
    font-weight: 700;
    margin-bottom: 1.5rem;
    color: #1f2937;
    text-align: center;
}
h3 {
    font-size: 1.125rem;
    font-weight: 600;
    margin-bottom: 1rem;
    color: var(--tw-color-primary-dark, #1e40af);
    border-bottom: 2px solid var(--tw-color-primary-light, #dbeafe);
    padding-bottom: 0.5rem;
}
 h4 {
    font-size: 1rem; /* text-base */
    font-weight: 600; /* font-semibold */
    margin-top: 1rem; /* mt-4 */
    margin-bottom: 0.75rem; /* mb-3 */
    color: #374151; /* text-gray-700 */
}
 h5 { /* Smaller heading for ROI sections */
    font-size: 1rem; /* text-base */
    font-weight: 600; /* font-semibold */
    margin-bottom: 0.75rem; /* mb-3 */
    text-align: center;
    color: #4b5563; /* text-gray-600 */
 }
.result-grid {
    display: grid;
    grid-template-columns: repeat(auto-fit, minmax(130px, 1fr));
    gap: 1rem;
    margin-top: 1rem;
}
.result-item {
    background-color: #f9fafb;
    padding: 0.75rem;
    border-radius: 0.375rem;
    border: 1px solid #e5e7eb;
    text-align: center;
}
.result-label {
    display: block;
    font-size: 0.875rem;
```

```
            font-weight: 500;
            color: #6b7280;
            margin-bottom: 0.25rem;
        }
        .result-value {
            display: block;
            font-size: 1.1rem;
            font-weight: 600;
            color: #1f2937;
        }
        .result-value.positive { color: var(--tw-color-secondary, #10b981); }
        .result-value.negative { color: #ef4444; }
        .summary-section {
            border-top: 1px solid #e5e7eb;
            margin-top: 1.5rem;
            padding-top: 1.5rem;
        }
        .modal { display: none; position: fixed; z-index: 1000; left: 0; top: 0; width: 100%; height: 100%;
overflow: auto; background-color: rgba(0,0,0,0.4); }
       .modal-content { background-color: #fefefe; margin: 15% auto; padding: 20px; border: 1px solid
#888; width: 80%; max-width: 400px; border-radius: 8px; text-align: center; box-shadow: 0 5px
15px rgba(0,0,0,0.2); }
        .modal-close { color: #aaa; float: right; font-size: 28px; font-weight: bold; cursor: pointer; }
        .modal-close:hover, .modal-close:focus { color: black; text-decoration: none; }
        .modal-button { background-color: var(--tw-color-primary, #3b82f6); color: white; padding:
10px 20px; border: none; border-radius: 5px; cursor: pointer; margin-top: 15px; font-weight: 500; }
        .text-xs { font-size: 0.75rem; }
        .input-group-title {
            font-size: 0.875rem;
            font-weight: 500;
            color: #6b7280; /* text-gray-500 */
            margin-bottom: 0.5rem;
        }
    </style>
</head>
<body class="p-4 sm:p-6 lg:p-8">

    <div class="max-w-screen-xl mx-auto">
        <h2>Comparateur 3 Scénarios Consommation & ROI Éclairage Garage</h2>

        <div class="grid grid-cols-1 lg:grid-cols-3 gap-6">
            <div class="card">
                <h3>Scénario 1 (Ex: Actuel)</h3>
                <h4>Éclairage LED</h4>
                 <div class="grid grid-cols-2 gap-4 mb-4">
                    <div>
                        <label for="ledStrips1">Nb. Réglettes LED</label>
                        <input type="number" id="ledStrips1" value="0">
                    </div>
                    <div>
                        <label for="ledPower1">Puissance / LED (W)</label>
                        <input type="number" id="ledPower1" value="20" step="1">
                    </div>
                 </div>
                 <div class="input-group-title">Utilisation LED (par jour)</div>
                 <div class="grid grid-cols-2 gap-4">
                     <div>
            <label for="ledTrashEvents1" class="event-label">Év. Poubelle /jour</label>
            <input type="number" id="ledTrashEvents1" value="10">
        </div>
        <div>
            <label for="ledVehicleEvents1" class="event-label">Év. Véhicule /jour</label>
            <input type="number" id="ledVehicleEvents1" value="20">
        </div>
         </div>

     <h4 class="mt-6">Éclairage Non-LED</h4>
     <div class="grid grid-cols-2 gap-4 mb-4">
        <div>
            <label for="nonLedStrips1">Nb. Réglettes Non-LED</label>
            <input type="number" id="nonLedStrips1" value="81">
        </div>
        <div>
            <label for="nonLedPower1">Puissance / Non-LED (W)</label>
            <input type="number" id="nonLedPower1" value="58" step="1">
        </div>
     </div>
      <div class="input-group-title">Utilisation Non-LED (par jour)</div>
     <div class="grid grid-cols-2 gap-4">
         <div>
            <label for="nonLedTrashEvents1" class="event-label">Év. Poubelle /jour</label>
            <input type="number" id="nonLedTrashEvents1" value="10">
        </div>
         <div>
            <label for="nonLedVehicleEvents1" class="event-label">Év. Véhicule /jour</label>
            <input type="number" id="nonLedVehicleEvents1" value="20">
        </div>
         </div>
</div>

<div class="card">
    <h3>Scénario 2 (Ex: Alternative)</h3>
     <h4>Éclairage LED</h4>
     <div class="grid grid-cols-2 gap-4 mb-4">
        <div>
            <label for="ledStrips2">Nb. Réglettes LED</label>
            <input type="number" id="ledStrips2" value="40">
        </div>
        <div>
            <label for="ledPower2">Puissance / LED (W)</label>
            <input type="number" id="ledPower2" value="18" step="1">
        </div>
     </div>
     <div class="input-group-title">Utilisation LED (par jour)</div>
     <div class="grid grid-cols-2 gap-4">
         <div>
            <label for="ledTrashEvents2" class="event-label">Év. Poubelle /jour</label>
            <input type="number" id="ledTrashEvents2" value="10">
        </div>
         <div>
            <label for="ledVehicleEvents2" class="event-label">Év. Véhicule /jour</label>
            <input type="number" id="ledVehicleEvents2" value="20">
        </div>
         </div>
     <h4 class="mt-6">Éclairage Non-LED</h4>
     <div class="grid grid-cols-2 gap-4 mb-4">
        <div>
            <label for="nonLedStrips2">Nb. Réglettes Non-LED</label>
            <input type="number" id="nonLedStrips2" value="41">
        </div>
        <div>
            <label for="nonLedPower2">Puissance / Non-LED (W)</label>
            <input type="number" id="nonLedPower2" value="36" step="1">
        </div>
     </div>
     <div class="input-group-title">Utilisation Non-LED (par jour)</div>
     <div class="grid grid-cols-2 gap-4">
         <div>
            <label for="nonLedTrashEvents2" class="event-label">Év. Poubelle /jour</label>
            <input type="number" id="nonLedTrashEvents2" value="10">
        </div>
         <div>
            <label for="nonLedVehicleEvents2" class="event-label">Év. Véhicule /jour</label>
            <input type="number" id="nonLedVehicleEvents2" value="20">
        </div>
         </div>
</div>

<div class="card">
    <h3>Scénario 3 (Ex: Intelligent)</h3>
    <h4>LED Intelligentes (avec détection)</h4>
     <div class="grid grid-cols-2 gap-4">
        <div>
            <label for="smartLedStrips3">Nb. Réglettes Smart LED</label>
            <input type="number" id="smartLedStrips3" value="81">
        </div>
        <div>
            <label for="smartLedZones3">Nb. Zones Smart LED</label>
            <input type="number" id="smartLedZones3" value="10">
        </div>
        <div>
            <label for="smartLedIdlePower3">Puissance Veille / LED (W)</label>
            <input type="number" id="smartLedIdlePower3" value="4" step="0.1">
        </div>
        <div>
            <label for="smartLedFullPower3">Puissance 100% / LED (W)</label>
            <input type="number" id="smartLedFullPower3" value="20" step="0.1">
        </div>
     </div>
     <h4 class="mt-4 text-sm">Utilisation Smart LED (par jour)</h4>
      <div class="grid grid-cols-2 gap-4"> <div>
            <label for="trashEvents3" class="text-xs">Év. Poubelle</label>
            <input type="number" id="trashEvents3" value="10">
        </div>
        <div>
            <label for="trashZonesActive3" class="text-xs">Zones Actives</label>
            <input type="number" id="trashZonesActive3" value="2">
        </div>
         <div>
            <label for="vehicleEvents3" class="text-xs">Év. Véhicule</label>
```

```
                       <input type="number" id="vehicleEvents3" value="20">
                    </div>
                    <div>
                       <label for="vehicleZonesActive3" class="text-xs">Zones Actives</label>
                       <input type="number" id="vehicleZonesActive3" value="4">
                    </div>
                 </div>
            </div>
        </div>

         <div class="grid grid-cols-1 md:grid-cols-3 gap-6 mt-6">
             <div class="card !mb-0 md:col-span-1">
                <h3>Paramètres Communs</h3>
                 <div>
                    <label for="kwhCost">Coût du kWh (€)</label>
                    <input type="number" id="kwhCost" value="0.25" step="0.01">
                 </div>
                 <div class="mt-4"> <label for="eventDuration">Durée d'allumage par événement (min)
</label>
                    <input type="number" id="eventDuration" value="3" step="0.1"> </div>
            </div>
             <div class="card !mb-0 md:col-span-2">
                 <h3>Investissements</h3>
                 <div class="grid grid-cols-1 sm:grid-cols-2 gap-4">
                     <div>
                       <label for="investmentCost2">Coût Solution Scénario 2 (€)</label>
                       <input type="number" id="investmentCost2" value="3000" step="10">
                     </div>
                     <div>
                       <label for="investmentCost3">Coût Solution Scénario 3 (€)</label>
                       <input type="number" id="investmentCost3" value="5000" step="10">
                     </div>
                 </div>
             </div>
        </div>


        <div class="card mt-6">
            <h3 class="!border-b-0">Résultats Comparatifs & ROI</h3>

            <div class="grid grid-cols-1 sm:grid-cols-2 lg:grid-cols-3 gap-4 mb-6">
                 <div class="result-item">
                    <span class="result-label">Conso. Jour Scén. 1</span>
                    <span class="result-value" id="dailyKwh1Result">-- kWh</span>
                </div>
                 <div class="result-item">
                    <span class="result-label">Conso. Jour Scén. 2</span>
                    <span class="result-value" id="dailyKwh2Result">-- kWh</span>
                </div>
                 <div class="result-item">
                    <span class="result-label">Conso. Jour Scén. 3</span>
                    <span class="result-value" id="dailyKwh3Result">-- kWh</span>
                </div>
                 <div class="result-item">
                    <span class="result-label">Coût Annuel Scén. 1</span>
                    <span class="result-value" id="yearlyCost1Result">-- €</span>
                </div>
            <div class="result-item">
                <span class="result-label">Coût Annuel Scén. 2</span>
                <span class="result-value" id="yearlyCost2Result">-- €</span>
            </div>
             <div class="result-item">
                <span class="result-label">Coût Annuel Scén. 3</span>
                <span class="result-value" id="yearlyCost3Result">-- €</span>
            </div>
        </div>

        <div class="summary-section grid grid-cols-1 md:grid-cols-2 gap-x-8 gap-y-6">
            <div>
                <h5 class="text-primary-dark">ROI (Scénario 1 vs Scénario 2)</h5>
                 <div class="result-grid">
                     <div class="result-item">
                        <span class="result-label">Investissement Scén. 2</span>
                        <span class="result-value" id="investmentResult2">-- €</span>
                    </div>
                    <div class="result-item">
                        <span class="result-label">Économies Annuelles</span>
                        <span class="result-value positive" id="roiSavingResult1v2">-- €</span>
                    </div>
                    <div class="result-item">
                        <span class="result-label">ROI Simple</span>
                        <span class="result-value positive" id="roiPercentageResult1v2">-- %</span>
                    </div>
                     <div class="result-item">
                        <span class="result-label">Temps de Retour</span>
                        <span class="result-value positive" id="roiPaybackResult1v2">-- ans</span>
                    </div>
                 </div>
             </div>
             <div>
                <h5 class="text-primary-dark">ROI (Scénario 1 vs Scénario 3)</h5>
                 <div class="result-grid">
                     <div class="result-item">
                        <span class="result-label">Investissement Scén. 3</span>
                        <span class="result-value" id="investmentResult3">-- €</span>
                    </div>
                    <div class="result-item">
                        <span class="result-label">Économies Annuelles</span>
                        <span class="result-value positive" id="roiSavingResult1v3">-- €</span>
                    </div>
                    <div class="result-item">
                        <span class="result-label">ROI Simple</span>
                        <span class="result-value positive" id="roiPercentageResult1v3">-- %</span>
                    </div>
                     <div class="result-item">
                        <span class="result-label">Temps de Retour</span>
                        <span class="result-value positive" id="roiPaybackResult1v3">-- ans</span>
                    </div>
                 </div>
             </div>
        </div>
    </div>
</div>
```

```
 <div id="errorModal" class="modal">
  <div class="modal-content">
    <span class="modal-close" id="modalClose">&times;</span>
    <p id="modalMessage" class="my-4 text-red-600 font-medium"></p>
    <button id="modalOkButton" class="modal-button">OK</button>
  </div>
</div>


<script>
    // --- Sélection des éléments du DOM ---
    const inputs = document.querySelectorAll('input[type="number"]');

    // Scenario 1 Inputs
    const ledStrips1Input = document.getElementById('ledStrips1');
    const ledPower1Input = document.getElementById('ledPower1');
    const ledTrashEvents1Input = document.getElementById('ledTrashEvents1');
    const ledVehicleEvents1Input = document.getElementById('ledVehicleEvents1');
    const nonLedStrips1Input = document.getElementById('nonLedStrips1');
    const nonLedPower1Input = document.getElementById('nonLedPower1');
    const nonLedTrashEvents1Input = document.getElementById('nonLedTrashEvents1');
    const nonLedVehicleEvents1Input = document.getElementById('nonLedVehicleEvents1');


    // Scenario 2 Inputs
    const ledStrips2Input = document.getElementById('ledStrips2');
    const ledPower2Input = document.getElementById('ledPower2');
    const ledTrashEvents2Input = document.getElementById('ledTrashEvents2');
    const ledVehicleEvents2Input = document.getElementById('ledVehicleEvents2');
    const nonLedStrips2Input = document.getElementById('nonLedStrips2');
    const nonLedPower2Input = document.getElementById('nonLedPower2');
    const nonLedTrashEvents2Input = document.getElementById('nonLedTrashEvents2');
    const nonLedVehicleEvents2Input = document.getElementById('nonLedVehicleEvents2');

    // Scenario 3 Inputs (Smart LED)
    const smartLedStrips3Input = document.getElementById('smartLedStrips3');
    const smartLedZones3Input = document.getElementById('smartLedZones3');
    const smartLedIdlePower3Input = document.getElementById('smartLedIdlePower3');
    const smartLedFullPower3Input = document.getElementById('smartLedFullPower3');
    const trashEvents3Input = document.getElementById('trashEvents3');
    const trashZonesActive3Input = document.getElementById('trashZonesActive3');
    const vehicleEvents3Input = document.getElementById('vehicleEvents3');
    const vehicleZonesActive3Input = document.getElementById('vehicleZonesActive3');

    // Common Inputs
    const kwhCostInput = document.getElementById('kwhCost');
    const eventDurationInput = document.getElementById('eventDuration'); // Nouveau global
    const investmentCost2Input = document.getElementById('investmentCost2');
    const investmentCost3Input = document.getElementById('investmentCost3');

    // Result Elements - Consumption
    const dailyKwh1Result = document.getElementById('dailyKwh1Result');
    const yearlyCost1Result = document.getElementById('yearlyCost1Result');
    const dailyKwh2Result = document.getElementById('dailyKwh2Result');
    const yearlyCost2Result = document.getElementById('yearlyCost2Result');
    const dailyKwh3Result = document.getElementById('dailyKwh3Result');
    const yearlyCost3Result = document.getElementById('yearlyCost3Result');
```

```
// Result Elements - ROI (1 vs 2)
const investmentResult2 = document.getElementById('investmentResult2');
const roiSavingResult1v2 = document.getElementById('roiSavingResult1v2');
const roiPercentageResult1v2 = document.getElementById('roiPercentageResult1v2');
const roiPaybackResult1v2 = document.getElementById('roiPaybackResult1v2');
// Result Elements - ROI (1 vs 3)
const investmentResult3 = document.getElementById('investmentResult3');
const roiSavingResult1v3 = document.getElementById('roiSavingResult1v3');
const roiPercentageResult1v3 = document.getElementById('roiPercentageResult1v3');
const roiPaybackResult1v3 = document.getElementById('roiPaybackResult1v3');


// Modal Elements
const errorModal = document.getElementById('errorModal');
const modalClose = document.getElementById('modalClose');
const modalMessage = document.getElementById('modalMessage');
const modalOkButton = document.getElementById('modalOkButton');


// --- Fonction de calcul principale ---
function calculateAllScenarios() {
    // --- Récupération des valeurs ---
    // Scenario 1
    const ledStrips1 = parseInt(ledStrips1Input.value) || 0;
    const ledPower1 = parseFloat(ledPower1Input.value) || 0;
    const ledTrashEvents1 = parseInt(ledTrashEvents1Input.value) || 0;
    const ledVehicleEvents1 = parseInt(ledVehicleEvents1Input.value) || 0;
    const nonLedStrips1 = parseInt(nonLedStrips1Input.value) || 0;
    const nonLedPower1 = parseFloat(nonLedPower1Input.value) || 0;
    const nonLedTrashEvents1 = parseInt(nonLedTrashEvents1Input.value) || 0;
    const nonLedVehicleEvents1 = parseInt(nonLedVehicleEvents1Input.value) || 0;

    // Scenario 2
    const ledStrips2 = parseInt(ledStrips2Input.value) || 0;
    const ledPower2 = parseFloat(ledPower2Input.value) || 0;
    const ledTrashEvents2 = parseInt(ledTrashEvents2Input.value) || 0;
    const ledVehicleEvents2 = parseInt(ledVehicleEvents2Input.value) || 0;
    const nonLedStrips2 = parseInt(nonLedStrips2Input.value) || 0;
    const nonLedPower2 = parseFloat(nonLedPower2Input.value) || 0;
    const nonLedTrashEvents2 = parseInt(nonLedTrashEvents2Input.value) || 0;
    const nonLedVehicleEvents2 = parseInt(nonLedVehicleEvents2Input.value) || 0;

     // Scenario 3 - Smart
    const smartLedStrips3 = parseInt(smartLedStrips3Input.value) || 0;
    const smartLedZones3 = parseInt(smartLedZones3Input.value) || 1; // Avoid division by zero
    const smartLedIdlePower3 = parseFloat(smartLedIdlePower3Input.value) || 0;
    const smartLedFullPower3 = parseFloat(smartLedFullPower3Input.value) || 0;
    const trashEvents3 = parseInt(trashEvents3Input.value) || 0;
    const trashZonesActive3 = parseInt(trashZonesActive3Input.value) || 0;
    const vehicleEvents3 = parseInt(vehicleEvents3Input.value) || 0;
    const vehicleZonesActive3 = parseInt(vehicleZonesActive3Input.value) || 0;

    // Common
    const kwhCost = parseFloat(kwhCostInput.value) || 0;
    const eventDuration = parseFloat(eventDurationInput.value) || 0; // Nouveau global (minutes)
    const investmentCost2 = parseFloat(investmentCost2Input.value) || 0;
    const investmentCost3 = parseFloat(investmentCost3Input.value) || 0;
```

```
        // --- Vérifications de base ---
         let errorMsg = "";
         const relevantValues = [ // Excludes removed duration variables
            ledStrips1, ledPower1, ledTrashEvents1, ledVehicleEvents1,
            nonLedStrips1, nonLedPower1, nonLedTrashEvents1, nonLedVehicleEvents1,
            ledStrips2, ledPower2, ledTrashEvents2, ledVehicleEvents2,
            nonLedStrips2, nonLedPower2, nonLedTrashEvents2, nonLedVehicleEvents2,
            smartLedStrips3, smartLedIdlePower3, smartLedFullPower3, trashEvents3,
trashZonesActive3,
            vehicleEvents3, vehicleZonesActive3,
            kwhCost, eventDuration, investmentCost2, investmentCost3 // Ajout eventDuration
         ];
         if (relevantValues.some(v => v < 0) || smartLedZones3 <= 0) {
             errorMsg = "Erreur : Vérifiez les valeurs d'entrée. Les nombres, puissances, événements,
durées et coûts ne peuvent pas être négatifs. Le nombre de zones doit être supérieur à 0.";
         } else if ((trashZonesActive3 > smartLedZones3 && smartLedStrips3 > 0) ||
(vehicleZonesActive3 > smartLedZones3 && smartLedStrips3 > 0)) {
            errorMsg = "Erreur Scénario 3 : Le nombre de zones actives ne peut pas dépasser le
nombre total de zones Smart LED.";
         }

         if (errorMsg) {
            resetResults();
            showModal(errorMsg);
            return;
         }


        // --- Calculs Scénario 1 ---
        // Utilisation de la durée globale par événement
        const totalLedMinutes1 = (ledTrashEvents1 * eventDuration) + (ledVehicleEvents1 *
eventDuration);
        const totalNonLedMinutes1 = (nonLedTrashEvents1 * eventDuration) +
(nonLedVehicleEvents1 * eventDuration);
        const dailyKwh1 = (ledStrips1 * ledPower1 / 1000 * totalLedMinutes1 / 60) + (nonLedStrips1 *
nonLedPower1 / 1000 * totalNonLedMinutes1 / 60);
        const yearlyCost1 = dailyKwh1 * 365 * kwhCost;

        // --- Calculs Scénario 2 ---
         // Utilisation de la durée globale par événement
        const totalLedMinutes2 = (ledTrashEvents2 * eventDuration) + (ledVehicleEvents2 *
eventDuration);
        const totalNonLedMinutes2 = (nonLedTrashEvents2 * eventDuration) +
(nonLedVehicleEvents2 * eventDuration);
        const dailyKwh2 = (ledStrips2 * ledPower2 / 1000 * totalLedMinutes2 / 60) + (nonLedStrips2
* nonLedPower2 / 1000 * totalNonLedMinutes2 / 60);
        const yearlyCost2 = dailyKwh2 * 365 * kwhCost;

        // --- Calculs Scénario 3 ---
        // Smart LED lights uniquement
        let idleSmartLedEnergy3_KWh_daily = 0;
        let trashSmartLedEnergy3_KWh_daily = 0;
        let vehicleSmartLedEnergy3_KWh_daily = 0;

        if (smartLedStrips3 > 0) {
           const avgStripsPerZone3 = smartLedStrips3 / smartLedZones3;
```

```
            const totalIdleSmartLedPower3_W = smartLedStrips3 * smartLedIdlePower3;
            let trashEventSmartLedPower3_W = totalIdleSmartLedPower3_W;
            if (trashZonesActive3 > 0) {
                const stripsInTrashActiveZones = avgStripsPerZone3 * trashZonesActive3;
                const stripsInTrashIdleZones = smartLedStrips3 - stripsInTrashActiveZones;
                trashEventSmartLedPower3_W = (Math.max(0, stripsInTrashActiveZones) * smartLedFullPower3) + (Math.max(0, stripsInTrashIdleZones) * smartLedIdlePower3);
            }
            let vehicleEventSmartLedPower3_W = totalIdleSmartLedPower3_W;
             if (vehicleZonesActive3 > 0) {
                const stripsInVehicleActiveZones = avgStripsPerZone3 * vehicleZonesActive3;
                const stripsInVehicleIdleZones = smartLedStrips3 - stripsInVehicleActiveZones;
                vehicleEventSmartLedPower3_W = (Math.max(0, stripsInVehicleActiveZones) * smartLedFullPower3) + (Math.max(0, stripsInVehicleIdleZones) * smartLedIdlePower3);
            }
            const totalMinutesInDay = 24 * 60;
            // Utilisation de la durée globale par événement
            const totalTrashDurationMinutes = trashEvents3 * eventDuration;
            const totalVehicleDurationMinutes = vehicleEvents3 * eventDuration;
            const totalSmartLedIdleDurationMinutes = Math.max(0, totalMinutesInDay - totalTrashDurationMinutes - totalVehicleDurationMinutes);

            idleSmartLedEnergy3_KWh_daily = (totalIdleSmartLedPower3_W / 1000) * (totalSmartLedIdleDurationMinutes / 60);
            trashSmartLedEnergy3_KWh_daily = (trashEventSmartLedPower3_W / 1000) * (totalTrashDurationMinutes / 60);
            vehicleSmartLedEnergy3_KWh_daily = (vehicleEventSmartLedPower3_W / 1000) * (totalVehicleDurationMinutes / 60);
        }
        // Total Scenario 3
        const dailyKwh3 = idleSmartLedEnergy3_KWh_daily + trashSmartLedEnergy3_KWh_daily + vehicleSmartLedEnergy3_KWh_daily;
        const yearlyCost3 = dailyKwh3 * 365 * kwhCost;


        // --- Calculs Comparaison & ROI ---
        // ROI (1 vs 2)
        const annualSavings1v2 = yearlyCost1 - yearlyCost2;
        const roiPercentage1v2 = (investmentCost2 > 0) ? (annualSavings1v2 / investmentCost2) * 100 : Infinity;
        const paybackYears1v2 = (annualSavings1v2 > 0) ? investmentCost2 / annualSavings1v2 : Infinity;

        // ROI (1 vs 3)
        const annualSavings1v3 = yearlyCost1 - yearlyCost3;
        const roiPercentage1v3 = (investmentCost3 > 0) ? (annualSavings1v3 / investmentCost3) * 100 : Infinity;
        const paybackYears1v3 = (annualSavings1v3 > 0) ? investmentCost3 / annualSavings1v3 : Infinity;

        // --- Affichage des résultats ---
        // Consommation & Coûts Annuels
        dailyKwh1Result.textContent = `${dailyKwh1.toFixed(2)} kWh`;
        yearlyCost1Result.textContent = `${yearlyCost1.toFixed(2)} €`;
        dailyKwh2Result.textContent = `${dailyKwh2.toFixed(2)} kWh`;
        yearlyCost2Result.textContent = `${yearlyCost2.toFixed(2)} €`;
        dailyKwh3Result.textContent = `${dailyKwh3.toFixed(2)} kWh`;
```

```
            yearlyCost3Result.textContent = `${yearlyCost3.toFixed(2)} €`;

            // ROI (1 vs 2)
            investmentResult2.textContent = `${investmentCost2.toFixed(2)} €`;
            roiSavingResult1v2.textContent = `${annualSavings1v2.toFixed(2)} €`;
            applySavingStyle(roiSavingResult1v2, annualSavings1v2);
            displayRoiResult(roiPercentageResult1v2, roiPercentage1v2, '%', 1);
            displayRoiResult(roiPaybackResult1v2, paybackYears1v2, 'ans', 1, annualSavings1v2 <= 0 &&
investmentCost2 > 0);


            // ROI (1 vs 3)
            investmentResult3.textContent = `${investmentCost3.toFixed(2)} €`;
            roiSavingResult1v3.textContent = `${annualSavings1v3.toFixed(2)} €`;
            applySavingStyle(roiSavingResult1v3, annualSavings1v3);
            displayRoiResult(roiPercentageResult1v3, roiPercentage1v3, '%', 1);
            displayRoiResult(roiPaybackResult1v3, paybackYears1v3, 'ans', 1, annualSavings1v3 <= 0 &&
investmentCost3 > 0);

        }

         // --- Helper pour Afficher les résultats ROI (%, ans) ---
         function displayRoiResult(element, value, unit, decimals, isNever = false) {
             element.className = 'result-value'; // Reset style
             if (isNever) {
                 element.textContent = "Jamais";
                 element.classList.add('negative');
             } else if (isFinite(value)) {
                 element.textContent = `${value.toFixed(decimals)} ${unit}`;
                 applySavingStyle(element, value); // Style based on value (positive/negative)
             } else {
                 element.textContent = "N/A";
             }
         }


         // --- Appliquer style Positif/Négatif ---
         function applySavingStyle(element, value) {
             element.classList.remove('positive', 'negative');
             if (value > 0) {
                 element.classList.add('positive');
             } else if (value < 0) {
                 element.classList.add('negative');
             }
         }

        // --- Fonction pour réinitialiser les résultats ---
        function resetResults() {
            const results = [
                dailyKwh1Result, yearlyCost1Result, dailyKwh2Result, yearlyCost2Result,
                dailyKwh3Result, yearlyCost3Result,
                investmentResult2, roiSavingResult1v2, roiPercentageResult1v2, roiPaybackResult1v2, //
ROI 1v2
                investmentResult3, roiSavingResult1v3, roiPercentageResult1v3, roiPaybackResult1v3 //
ROI 1v3
            ];
            results.forEach(el => {
                if(el) {
                    el.textContent = '--';
                    el.className = 'result-value'; // Reset style
                }
            });
             // Reset specific units
             if(dailyKwh1Result) dailyKwh1Result.textContent = '-- kWh';
             if(yearlyCost1Result) yearlyCost1Result.textContent = '-- €';
             if(dailyKwh2Result) dailyKwh2Result.textContent = '-- kWh';
             if(yearlyCost2Result) yearlyCost2Result.textContent = '-- €';
             if(dailyKwh3Result) dailyKwh3Result.textContent = '-- kWh';
             if(yearlyCost3Result) yearlyCost3Result.textContent = '-- €';
             if(investmentResult2) investmentResult2.textContent = '-- €';
             if(roiSavingResult1v2) roiSavingResult1v2.textContent = '-- €';
             if(roiPercentageResult1v2) roiPercentageResult1v2.textContent = '-- %';
             if(roiPaybackResult1v2) roiPaybackResult1v2.textContent = '-- ans';
             if(investmentResult3) investmentResult3.textContent = '-- €';
             if(roiSavingResult1v3) roiSavingResult1v3.textContent = '-- €';
             if(roiPercentageResult1v3) roiPercentageResult1v3.textContent = '-- %';
             if(roiPaybackResult1v3) roiPaybackResult1v3.textContent = '-- ans';
        }

        // --- Fonction pour afficher/cacher la modal ---
        function showModal(message) {
            modalMessage.textContent = message;
            errorModal.style.display = "block";
        }
        function closeModal() {
            errorModal.style.display = "none";
        }

        // --- Ajout des écouteurs d'événements ---
        inputs.forEach(input => input.addEventListener('input', calculateAllScenarios));
        modalClose.addEventListener('click', closeModal);
        modalOkButton.addEventListener('click', closeModal);
        window.addEventListener('click', (event) => {
          if (event.target == errorModal) { closeModal(); }
        });

        // --- Calcul initial au chargement ---
        calculateAllScenarios();

    </script>

</body>
</html>
```