```html
<!DOCTYPE html>
<html lang="nl">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Universele Zonnepanelen Calculator</title>
    <script src="https://cdn.jsdelivr.net/npm/chart.js"></script>
    <script
src="https://cdn.jsdelivr.net/npm/chartjs-plugin-datalabels@2.0.0"></script>
    <link rel="stylesheet"
href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/6.4.0/css/all.min.css"
>
    <style>
        :root {
            --primary-sun: #FFB347;
            --primary-blue: #3498db;
            --primary-green: #2ecc71;
            --dark-bg: #2c3e50;
            --light-bg: #ecf0f1;
            --card-bg: #ffffff;
            --text-dark: #2c3e50;
            --text-light: #7f8c8d;
            --border-color: #bdc3c7;
        }

        * {
            margin: 0;
            padding: 0;
            box-sizing: border-box;
        }

        body {
            font-family: 'Segoe UI', Tahoma, Geneva, Verdana, sans-serif;
            background: linear-gradient(135deg, #667eea 0%, #764ba2 100%);
            color: var(--text-dark);
            line-height: 1.6;
            min-height: 100vh;
            padding: 20px;
            transition: background 0.3s ease;
        }

        /* RTL Support */
        body.rtl {
            direction: rtl;
            text-align: right;
            font-family: 'Segoe UI', Tahoma, 'Arial', sans-serif;
        }

        body.rtl .input-group label,
        body.rtl .result-label,
        body.rtl .chart-container h3,
        body.rtl .info-box p,
        body.rtl .language-selector {
            text-align: right;
```

```css
}

body.rtl .input-group input,
body.rtl .input-group select {
    text-align: right;
}

.container {
    max-width: 1200px;
    margin: 0 auto;
    background: rgba(255, 255, 255, 0.95);
    border-radius: 20px;
    overflow: hidden;
    box-shadow: 0 20px 60px rgba(0, 0, 0, 0.3);
    position: relative;
}

/* Language Selector */
.language-selector {
    position: absolute;
    top: 20px;
    right: 20px;
    z-index: 1000;
    display: flex;
    gap: 10px;
    flex-wrap: wrap;
    justify-content: flex-end;
}

.lang-btn {
    padding: 8px 15px;
    background: var(--card-bg);
    border: 2px solid var(--primary-blue);
    border-radius: 30px;
    cursor: pointer;
    font-weight: 600;
    font-size: 0.85rem;
    color: var(--primary-blue);
    transition: all 0.3s ease;
    display: flex;
    align-items: center;
    gap: 8px;
}

.lang-btn:hover {
    background: var(--primary-blue);
    color: white;
    transform: translateY(-2px);
}

.lang-btn.active {
    background: var(--primary-blue);
    color: white;
}
```

```css
.lang-btn i {
    font-size: 1rem;
}

/* Header */
header {
    background: linear-gradient(135deg, var(--dark-bg) 0%, #34495e
100%);
    color: white;
    padding: 40px 30px 30px;
    text-align: center;
    position: relative;
}

.header-content {
    max-width: 800px;
    margin: 0 auto;
}

h1 {
    font-size: 2.8rem;
    margin-bottom: 15px;
    color: white;
    display: flex;
    align-items: center;
    justify-content: center;
    gap: 15px;
}

.subtitle {
    font-size: 1.2rem;
    color: rgba(255, 255, 255, 0.9);
    margin-bottom: 25px;
    max-width: 600px;
    margin-left: auto;
    margin-right: auto;
}

/* Main Content Layout */
.main-content {
    display: grid;
    grid-template-columns: 1fr 1fr;
    gap: 30px;
    padding: 30px;
}

@media (max-width: 992px) {
    .main-content {
        grid-template-columns: 1fr;
    }
}

/* Input Section */
```

```css
.input-section {
    background: var(--light-bg);
    border-radius: 15px;
    padding: 30px;
    box-shadow: 0 5px 20px rgba(0, 0, 0, 0.1);
}

.section-title {
    color: var(--dark-bg);
    font-size: 1.8rem;
    margin-bottom: 25px;
    padding-bottom: 15px;
    border-bottom: 3px solid var(--primary-sun);
    display: flex;
    align-items: center;
    gap: 10px;
}

.section-title i {
    color: var(--primary-sun);
}

.input-grid {
    display: grid;
    grid-template-columns: 1fr 1fr;
    gap: 20px;
    margin-bottom: 30px;
}

@media (max-width: 768px) {
    .input-grid {
        grid-template-columns: 1fr;
    }
}

.input-group {
    display: flex;
    flex-direction: column;
}

.input-group.full-width {
    grid-column: 1 / -1;
}

.input-group label {
    margin-bottom: 8px;
    font-weight: 600;
    color: var(--dark-bg);
    font-size: 1rem;
    display: flex;
    align-items: center;
    gap: 8px;
}
```

```css
.input-group label i {
    color: var(--primary-blue);
}

.input-group input,
.input-group select {
    padding: 14px 15px;
    border: 2px solid var(--border-color);
    border-radius: 10px;
    font-size: 1rem;
    transition: all 0.3s;
    background: white;
}

.input-group input:focus,
.input-group select:focus {
    outline: none;
    border-color: var(--primary-blue);
    box-shadow: 0 0 0 3px rgba(52, 152, 219, 0.2);
}

.input-hint {
    font-size: 0.85rem;
    color: var(--text-light);
    margin-top: 5px;
    font-style: italic;
}

.slider-container {
    margin-top: 10px;
}

.slider-value {
    display: flex;
    justify-content: space-between;
    margin-bottom: 5px;
}

input[type="range"] {
    width: 100%;
    height: 8px;
    -webkit-appearance: none;
    background: linear-gradient(to right, #3498db, #2ecc71);
    border-radius: 4px;
    outline: none;
}

input[type="range"]::-webkit-slider-thumb {
    -webkit-appearance: none;
    width: 22px;
    height: 22px;
    border-radius: 50%;
    background: var(--primary-blue);
    cursor: pointer;
```

```css
        border: 3px solid white;
        box-shadow: 0 2px 5px rgba(0,0,0,0.2);
    }

    /* Calculate Button */
    .calculate-btn {
        background: linear-gradient(135deg, var(--primary-sun) 0%, #FF8C00
100%);
        color: white;
        border: none;
        padding: 18px 40px;
        border-radius: 12px;
        cursor: pointer;
        font-size: 1.2rem;
        font-weight: 700;
        width: 100%;
        margin: 20px 0;
        display: flex;
        align-items: center;
        justify-content: center;
        gap: 12px;
        transition: all 0.3s ease;
        box-shadow: 0 6px 20px rgba(255, 179, 71, 0.4);
    }

    .calculate-btn:hover {
        transform: translateY(-3px);
        box-shadow: 0 10px 25px rgba(255, 179, 71, 0.6);
    }

    .calculate-btn:active {
        transform: translateY(-1px);
    }

    /* Results Section */
    .results-section {
        background: var(--card-bg);
        border-radius: 15px;
        padding: 30px;
        box-shadow: 0 5px 20px rgba(0, 0, 0, 0.1);
    }

    .results-grid {
        display: grid;
        grid-template-columns: repeat(2, 1fr);
        gap: 20px;
        margin-bottom: 30px;
    }

    .result-card {
        background: linear-gradient(135deg, #f8f9fa 0%, #e9ecef 100%);
        border-radius: 12px;
        padding: 25px 20px;
        text-align: center;
```

```css
    border: 2px solid transparent;
    transition: all 0.3s ease;
    position: relative;
    overflow: hidden;
}

.result-card:hover {
    transform: translateY(-5px);
    border-color: var(--primary-blue);
    box-shadow: 0 10px 25px rgba(0, 0, 0, 0.1);
}

.result-card.primary {
    background: linear-gradient(135deg, var(--primary-blue) 0%, #2980b9 100%);
    color: white;
}

.result-card.primary .result-label {
    color: rgba(255, 255, 255, 0.9);
}

.result-card.primary .result-value {
    color: white;
}

.result-label {
    font-size: 1rem;
    color: var(--text-light);
    margin-bottom: 10px;
    display: block;
    font-weight: 600;
}

.result-value {
    font-size: 2.5rem;
    font-weight: 800;
    color: var(--dark-bg);
    line-height: 1.2;
}

.result-unit {
    font-size: 1rem;
    color: var(--text-light);
    margin-top: 5px;
    display: block;
}

/* Charts */
.chart-container {
    background: var(--light-bg);
    border-radius: 12px;
    padding: 25px;
    margin-bottom: 25px;
```

```css
        box-shadow: 0 3px 15px rgba(0, 0, 0, 0.05);
    }

    .chart-container h3 {
        color: var(--dark-bg);
        margin-bottom: 20px;
        font-size: 1.3rem;
        display: flex;
        align-items: center;
        gap: 10px;
    }

    .chart-container h3 i {
        color: var(--primary-sun);
    }

    .chart-box {
        height: 250px;
        width: 100%;
        position: relative;
    }

    /* Comparison Table */
    .comparison-table {
        width: 100%;
        border-collapse: collapse;
        background: white;
        border-radius: 10px;
        overflow: hidden;
        box-shadow: 0 3px 15px rgba(0, 0, 0, 0.05);
        margin-top: 20px;
    }

    .comparison-table th {
        background: var(--primary-blue);
        color: white;
        padding: 15px;
        text-align: left;
        font-weight: 600;
    }

    .comparison-table td {
        padding: 12px 15px;
        border-bottom: 1px solid var(--border-color);
    }

    .comparison-table tr:last-child td {
        border-bottom: none;
    }

    .comparison-table tr:hover {
        background: var(--light-bg);
    }
```

```css
/* Info Box */
.info-box {
    background: linear-gradient(135deg, #e8f4fc 0%, #d1ecf1 100%);
    border-left: 5px solid var(--primary-blue);
    padding: 20px;
    border-radius: 8px;
    margin-top: 25px;
}

.info-box h4 {
    color: var(--dark-bg);
    margin-bottom: 10px;
    display: flex;
    align-items: center;
    gap: 10px;
}

.info-box p {
    color: var(--text-dark);
    line-height: 1.6;
}

/* Footer */
footer {
    text-align: center;
    padding: 25px;
    background: var(--dark-bg);
    color: white;
    margin-top: 30px;
}

.footer-content {
    max-width: 800px;
    margin: 0 auto;
}

footer p {
    margin-bottom: 10px;
    color: rgba(255, 255, 255, 0.8);
}

/* Responsive */
@media (max-width: 768px) {
    .container {
        margin: 10px;
        border-radius: 15px;
    }

    header {
        padding: 30px 20px 25px;
    }

    h1 {
        font-size: 2rem;
```

```css
        }

        .main-content {
            padding: 20px;
            gap: 20px;
        }

        .input-section,
        .results-section {
            padding: 25px;
        }

        .results-grid {
            grid-template-columns: 1fr;
            gap: 15px;
        }

        .result-value {
            font-size: 2rem;
        }

        .language-selector {
            position: relative;
            top: 0;
            right: 0;
            justify-content: center;
            margin-bottom: 20px;
        }
    }

    @media (max-width: 480px) {
        body {
            padding: 10px;
        }

        h1 {
            font-size: 1.7rem;
            flex-direction: column;
            gap: 10px;
        }

        .section-title {
            font-size: 1.5rem;
        }

        .result-value {
            font-size: 1.8rem;
        }
    }
    </style>
</head>
<body>
    <div class="container">
        <!-- Language Selector -->
```

```html
        <div class="language-selector">
            <button class="lang-btn active" data-lang="nl"><i class="fas
fa-language"></i> NL</button>
            <button class="lang-btn" data-lang="en"><i class="fas
fa-language"></i> EN</button>
            <button class="lang-btn" data-lang="de"><i class="fas
fa-language"></i> DE</button>
            <button class="lang-btn" data-lang="fr"><i class="fas
fa-language"></i> FR</button>
            <button class="lang-btn" data-lang="es"><i class="fas
fa-language"></i> ES</button>
            <button class="lang-btn" data-lang="it"><i class="fas
fa-language"></i> IT</button>
            <button class="lang-btn" data-lang="zh"><i class="fas
fa-language"></i> 中文</button>
            <button class="lang-btn" data-lang="he"><i class="fas
fa-language"></i> עברית</button>
            <button class="lang-btn" data-lang="ar"><i class="fas
fa-language"></i> العربية</button>
            <button class="lang-btn" data-lang="ja"><i class="fas
fa-language"></i> 日本語</button>
        </div>

        <!-- Header -->
        <header>
            <div class="header-content">
                <h1><i class="fas fa-solar-panel"></i> <span
data-i18n="title">Universele Zonnepanelen Calculator</span></h1>
                <p class="subtitle" data-i18n="subtitle">Bereken exact het
vermogen en de opbrengst van uw zonnepanelensysteem</p>
            </div>
        </header>

        <!-- Main Content -->
        <div class="main-content">
            <!-- Input Section -->
            <section class="input-section">
                <h2 class="section-title"><i class="fas fa-sliders-h"></i> <span
data-i18n="inputTitle">Systeem Parameters</span></h2>

                <div class="input-grid">
                    <div class="input-group">
                        <label for="panelCount"><i class="fas fa-th-large"></i>
<span data-i18n="panelCount">Aantal panelen</span></label>
                        <input type="number" id="panelCount" min="1" max="100"
value="12">
                        <div class="input-hint"
data-i18n="panelCountHint">Typisch 8-16 voor een woonhuis</div>
                    </div>

                    <div class="input-group">
                        <label for="panelPower"><i class="fas fa-bolt"></i>
<span data-i18n="panelPower">Vermogen per paneel (Wp)</span></label>
                        <input type="number" id="panelPower" min="100" max="700"
```

```html
value="400">
                            <div class="input-hint"
data-i18n="panelPowerHint">Moderne panelen: 350-550 Wp</div>
                        </div>

                        <div class="input-group">
                            <label for="efficiency"><i class="fas
fa-percentage"></i> <span data-i18n="efficiency">Systeemefficiëntie
(%)</span></label>
                            <input type="range" id="efficiency" min="70" max="95"
step="1" value="85">
                            <div class="slider-value">
                                <span>70%</span>
                                <span id="efficiencyValue">85%</span>
                                <span>95%</span>
                            </div>
                            <div class="input-hint"
data-i18n="efficiencyHint">Beïnvloed door omvormer, oriëntatie & schaduw</div>
                        </div>

                        <div class="input-group">
                            <label for="location"><i class="fas
fa-map-marker-alt"></i> <span data-i18n="location">Regio /
Zoninstraling</span></label>
                            <select id="location">
                                <option value="1.05">Nederland/België
(Gemiddeld)</option>
                                <option value="1.15">Zuid-Europa (Hoog)</option>
                                <option value="0.95">Noord-Europa (Laag)</option>
                            </select>
                            <div class="input-hint"
data-i18n="locationHint">Gemiddelde zonuren per dag</div>
                        </div>

                        <div class="input-group full-width">
                            <label for="roofAngle"><i class="fas fa-mountain"></i>
<span data-i18n="roofAngle">Dakhelling & Richting</span></label>
                            <select id="roofAngle">
                                <option value="1.0">Ideaal (Zuid, 35°
helling)</option>
                                <option value="0.95">Goed (Zuid-Oost/Zuid-West,
25-45°)</option>
                                <option value="0.85">Redelijk (Oost/West,
15-55°)</option>
                                <option value="0.7">Suboptimaal (Noord/Plat
dak)</option>
                            </select>
                            <div class="input-hint"
data-i18n="roofAngleHint">Oriëntatie en hoek van uw dak</div>
                        </div>
                    </div>

                    <button class="calculate-btn" id="calculateBtn">
                        <i class="fas fa-calculator"></i> <span
```

```
                data-i18n="calculateBtn">Bereken Opbrengst</span>
                </button>

                <div class="info-box">
                    <h4><i class="fas fa-lightbulb"></i> <span
data-i18n="infoTitle">Tips voor maximale opbrengst</span></h4>
                    <p data-i18n="infoText">• Zuidelijke oriëntatie (tussen
Zuidoost en Zuidwest)<br>• Hellingshoek tussen 20° en 40°<br>• Zorg voor
schaduwvrije installatie<br>• Kwalitatieve omvormer voor optimale
efficiëntie</p>
                </div>
            </section>

            <!-- Results Section -->
            <section class="results-section">
                <h2 class="section-title"><i class="fas fa-chart-line"></i>
<span data-i18n="resultsTitle">Berekeningsresultaten</span></h2>

                <div class="results-grid">
                    <div class="result-card primary">
                        <span class="result-label" data-i18n="totalPower">Totaal
Vermogen</span>
                        <div class="result-value" id="totalPower">4.8</div>
                        <span class="result-unit">kWp</span>
                    </div>

                    <div class="result-card">
                        <span class="result-label"
data-i18n="yearlyProduction">Jaaropbrengst</span>
                        <div class="result-value"
id="yearlyProduction">4.080</div>
                        <span class="result-unit">kWh/jaar</span>
                    </div>

                    <div class="result-card">
                        <span class="result-label"
data-i18n="dailyProduction">Dagopbrengst (gem.)</span>
                        <div class="result-value"
id="dailyProduction">11.2</div>
                        <span class="result-unit">kWh/dag</span>
                    </div>

                    <div class="result-card">
                        <span class="result-label"
data-i18n="coverageRate">Dekkingsgraad</span>
                        <div class="result-value" id="coverageRate">117%</div>
                        <span class="result-unit" data-i18n="ofConsumption">van
verbruik</span>
                    </div>
                </div>

                <div class="chart-container">
                    <h3><i class="fas fa-chart-pie"></i> <span
data-i18n="seasonalChart">Seizoensopbrengst</span></h3>
```

```html
                    <div class="chart-box">
                        <canvas id="seasonChart"></canvas>
                    </div>
                </div>

                <div class="chart-container">
                    <h3><i class="fas fa-chart-bar"></i> <span
data-i18n="monthlyChart">Maandelijkse Opbrengst</span></h3>
                    <div class="chart-box">
                        <canvas id="monthlyChart"></canvas>
                    </div>
                </div>

                <table class="comparison-table">
                    <thead>
                        <tr>
                            <th data-i18n="parameter">Parameter</th>
                            <th data-i18n="value">Waarde</th>
                            <th data-i18n="impact">Impact op opbrengst</th>
                        </tr>
                    </thead>
                    <tbody>
                        <tr>
                            <td data-i18n="panelType">Paneeltype</td>
                            <td id="panelTypeValue">Monokristallijn</td>
                            <td id="panelTypeImpact">+15% t.o.v. poly</td>
                        </tr>
                        <tr>
                            <td data-i18n="inverterEff">Omvormer
efficiëntie</td>
                            <td id="inverterEffValue">97%</td>
                            <td id="inverterEffImpact">Hoog (±3% verlies)</td>
                        </tr>
                        <tr>
                            <td data-i18n="temperature">Temperatuurverlies</td>
                            <td id="temperatureValue">-8%</td>
                            <td id="temperatureImpact">Gemiddeld (zomer)</td>
                        </tr>
                        <tr>
                            <td data-i18n="systemLoss">Totaal
systeemverlies</td>
                            <td id="systemLossValue">14%</td>
                            <td id="systemLossImpact">Normaal voor
installatie</td>
                        </tr>
                    </tbody>
                </table>
            </section>
        </div>

        <!-- Footer -->
        <footer>
            <div class="footer-content">
                <p data-i18n="footer1">Deze calculator geeft een realistische
```

schatting. Werkelijke opbrengst kan variëren door lokale omstandigheden.</p>
                    <p data-i18n="footer2">© 2024 Universele Zonnepanelen Calculator
| Voor professioneel advies raadpleeg een gecertificeerd installateur.</p>
                </div>
            </footer>
        </div>

        <script>
            // ==
            // TRANSLATION SYSTEM
            // ==

            const translations = {
                nl: {
                    "title": "Universele Zonnepanelen Calculator",
                    "subtitle": "Bereken exact het vermogen en de opbrengst van uw
zonnepanelensysteem",
                    "inputTitle": "Systeem Parameters",
                    "panelCount": "Aantal panelen",
                    "panelCountHint": "Typisch 8-16 voor een woonhuis",
                    "panelPower": "Vermogen per paneel (Wp)",
                    "panelPowerHint": "Moderne panelen: 350-550 Wp",
                    "efficiency": "Systeemefficiëntie (%)",
                    "efficiencyHint": "Beïnvloed door omvormer, oriëntatie &
schaduw",
                    "location": "Regio / Zoninstraling",
                    "locationHint": "Gemiddelde zonuren per dag",
                    "roofAngle": "Dakhelling & Richting",
                    "roofAngleHint": "Oriëntatie en hoek van uw dak",
                    "calculateBtn": "Bereken Opbrengst",
                    "infoTitle": "Tips voor maximale opbrengst",
                    "infoText": "• Zuidelijke oriëntatie (tussen Zuidoost en
Zuidwest)
• Hellingshoek tussen 20° en 40°
• Zorg voor schaduwvrije
installatie
• Kwalitatieve omvormer voor optimale efficiëntie",
                    "resultsTitle": "Berekeningsresultaten",
                    "totalPower": "Totaal Vermogen",
                    "yearlyProduction": "Jaaropbrengst",
                    "dailyProduction": "Dagopbrengst (gem.)",
                    "coverageRate": "Dekkingsgraad",
                    "ofConsumption": "van verbruik",
                    "seasonalChart": "Seizoensopbrengst",
                    "monthlyChart": "Maandelijkse Opbrengst",
                    "parameter": "Parameter",
                    "value": "Waarde",
                    "impact": "Impact op opbrengst",
                    "panelType": "Paneeltype",
                    "inverterEff": "Omvormer efficiëntie",
                    "temperature": "Temperatuurverlies",
                    "systemLoss": "Totaal systeemverlies",
                    "footer1": "Deze calculator geeft een realistische schatting.
Werkelijke opbrengst kan variëren door lokale omstandigheden.",
                    "footer2": "© 2024 Universele Zonnepanelen Calculator | Voor
professioneel advies raadpleeg een gecertificeerd installateur.",
                    "months": ["Jan", "Feb", "Mrt", "Apr", "Mei", "Jun", "Jul",

```
                "Aug", "Sep", "Okt", "Nov", "Dec"],
                "seasons": ["Winter", "Lente", "Zomer", "Herfst"]
            },
            en: {
                "title": "Universal Solar Panel Calculator",
                "subtitle": "Calculate exactly the power and yield of your solar
panel system",
                "inputTitle": "System Parameters",
                "panelCount": "Number of panels",
                "panelCountHint": "Typically 8-16 for a house",
                "panelPower": "Power per panel (Wp)",
                "panelPowerHint": "Modern panels: 350-550 Wp",
                "efficiency": "System efficiency (%)",
                "efficiencyHint": "Affected by inverter, orientation & shading",
                "location": "Region / Solar irradiation",
                "locationHint": "Average sunshine hours per day",
                "roofAngle": "Roof tilt & Direction",
                "roofAngleHint": "Orientation and angle of your roof",
                "calculateBtn": "Calculate Yield",
                "infoTitle": "Tips for maximum yield",
                "infoText": "• Southern orientation (between Southeast and
Southwest)<br>• Tilt angle between 20° and 40°<br>• Ensure shade-free
installation<br>• Quality inverter for optimal efficiency",
                "resultsTitle": "Calculation Results",
                "totalPower": "Total Power",
                "yearlyProduction": "Annual Production",
                "dailyProduction": "Daily Production (avg.)",
                "coverageRate": "Coverage Rate",
                "ofConsumption": "of consumption",
                "seasonalChart": "Seasonal Yield",
                "monthlyChart": "Monthly Production",
                "parameter": "Parameter",
                "value": "Value",
                "impact": "Impact on yield",
                "panelType": "Panel type",
                "inverterEff": "Inverter efficiency",
                "temperature": "Temperature loss",
                "systemLoss": "Total system loss",
                "footer1": "This calculator provides a realistic estimate.
Actual yield may vary due to local conditions.",
                "footer2": "© 2024 Universal Solar Panel Calculator | For
professional advice consult a certified installer.",
                "months": ["Jan", "Feb", "Mar", "Apr", "May", "Jun", "Jul",
"Aug", "Sep", "Oct", "Nov", "Dec"],
                "seasons": ["Winter", "Spring", "Summer", "Autumn"]
            },
            de: {
                "title": "Universeller Solarpanel Rechner",
                "subtitle": "Berechnen Sie genau die Leistung und den Ertrag
Ihres Solarpanelsystems",
                "inputTitle": "Systemparameter",
                "panelCount": "Anzahl der Panels",
                "panelCountHint": "Typisch 8-16 für ein Haus",
                "panelPower": "Leistung pro Panel (Wp)",
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```
                    "panelPowerHint": "Moderne Panels: 350-550 Wp",
                    "efficiency": "Systemeffizienz (%)",
                    "efficiencyHint": "Beeinflusst durch Wechselrichter, Ausrichtung
& Beschattung",
                    "location": "Region / Sonneneinstrahlung",
                    "locationHint": "Durchschnittliche Sonnenstunden pro Tag",
                    "roofAngle": "Dachneigung & Richtung",
                    "roofAngleHint": "Ausrichtung und Neigung Ihres Dachs",
                    "calculateBtn": "Ertrag berechnen",
                    "infoTitle": "Tipps für maximalen Ertrag",
                    "infoText": "• Südliche Ausrichtung (zwischen Südost und
Südwest)<br>• Neigungswinkel zwischen 20° und 40°<br>• Schattenfreie
Installation sicherstellen<br>• Qualitätswechselrichter für optimale Effizienz",
                    "resultsTitle": "Berechnungsergebnisse",
                    "totalPower": "Gesamtleistung",
                    "yearlyProduction": "Jahresertrag",
                    "dailyProduction": "Tagesertrag (Durchs.)",
                    "coverageRate": "Abdeckungsgrad",
                    "ofConsumption": "des Verbrauchs",
                    "seasonalChart": "Saisonaler Ertrag",
                    "monthlyChart": "Monatlicher Ertrag",
                    "parameter": "Parameter",
                    "value": "Wert",
                    "impact": "Auswirkung auf Ertrag",
                    "panelType": "Paneltyp",
                    "inverterEff": "Wechselrichterwirkungsgrad",
                    "temperature": "Temperaturverlust",
                    "systemLoss": "Gesamtsystemverlust",
                    "footer1": "Dieser Rechner liefert eine realistische Schätzung.
Der tatsächliche Ertrag kann aufgrund lokaler Bedingungen variieren.",
                    "footer2": "© 2024 Universeller Solarpanel Rechner | Für
professionelle Beratung einen zertifizierten Installateur konsultieren.",
                    "months": ["Jan", "Feb", "Mär", "Apr", "Mai", "Jun", "Jul",
"Aug", "Sep", "Okt", "Nov", "Dez"],
                    "seasons": ["Winter", "Frühling", "Sommer", "Herbst"]
                },
                fr: {
                    "title": "Calculateur Universel de Panneaux Solaires",
                    "subtitle": "Calculez exactement la puissance et le rendement de
votre système de panneaux solaires",
                    "inputTitle": "Paramètres du Système",
                    "panelCount": "Nombre de panneaux",
                    "panelCountHint": "Typiquement 8-16 pour une maison",
                    "panelPower": "Puissance par panneau (Wc)",
                    "panelPowerHint": "Panneaux modernes: 350-550 Wc",
                    "efficiency": "Efficacité système (%)",
                    "efficiencyHint": "Affectée par l'onduleur, l'orientation &
l'ombrage",
                    "location": "Région / Ensoleillement",
                    "locationHint": "Heures d'ensoleillement moyennes par jour",
                    "roofAngle": "Inclinaison & Orientation du toit",
                    "roofAngleHint": "Orientation et angle de votre toit",
                    "calculateBtn": "Calculer le Rendement",
                    "infoTitle": "Conseils pour un rendement maximal",
```

```
            "infoText": "• Orientation sud (entre sud-est et sud-ouest)<br>•
Angle d'inclinaison entre 20° et 40°<br>• Installation sans ombre<br>• Onduleur
de qualité pour une efficacité optimale",
            "resultsTitle": "Résultats du Calcul",
            "totalPower": "Puissance Totale",
            "yearlyProduction": "Production Annuelle",
            "dailyProduction": "Production Quotidienne (moy.)",
            "coverageRate": "Taux de Couverture",
            "ofConsumption": "de la consommation",
            "seasonalChart": "Rendement Saisonnier",
            "monthlyChart": "Production Mensuelle",
            "parameter": "Paramètre",
            "value": "Valeur",
            "impact": "Impact sur le rendement",
            "panelType": "Type de panneau",
            "inverterEff": "Efficacité de l'onduleur",
            "temperature": "Perte de température",
            "systemLoss": "Perte système totale",
            "footer1": "Cette calculatrice fournit une estimation réaliste.
Le rendement réel peut varier selon les conditions locales.",
            "footer2": "© 2024 Calculateur Universel de Panneaux Solaires |
Pour des conseils professionnels, consultez un installateur certifié.",
            "months": ["Jan", "Fév", "Mar", "Avr", "Mai", "Jun", "Jul",
"Aoû", "Sep", "Oct", "Nov", "Déc"],
            "seasons": ["Hiver", "Printemps", "Été", "Automne"]
        },
        es: {
            "title": "Calculadora Universal de Paneles Solares",
            "subtitle": "Calcule exactamente la potencia y el rendimiento de
su sistema de paneles solares",
            "inputTitle": "Parámetros del Sistema",
            "panelCount": "Número de paneles",
            "panelCountHint": "Típicamente 8-16 para una casa",
            "panelPower": "Potencia por panel (Wp)",
            "panelPowerHint": "Paneles modernos: 350-550 Wp",
            "efficiency": "Eficiencia del sistema (%)",
            "efficiencyHint": "Afectada por el inversor, orientación y
sombreado",
            "location": "Región / Irradiación solar",
            "locationHint": "Horas de sol promedio por día",
            "roofAngle": "Inclinación y Dirección del tejado",
            "roofAngleHint": "Orientación y ángulo de su tejado",
            "calculateBtn": "Calcular Rendimiento",
            "infoTitle": "Consejos para máximo rendimiento",
            "infoText": "• Orientación sur (entre sureste y suroeste)<br>•
Ángulo de inclinación entre 20° y 40°<br>• Instalación libre de sombras<br>•
Inversor de calidad para eficiencia óptima",
            "resultsTitle": "Resultados del Cálculo",
            "totalPower": "Potencia Total",
            "yearlyProduction": "Producción Anual",
            "dailyProduction": "Producción Diaria (prom.)",
            "coverageRate": "Tasa de Cobertura",
            "ofConsumption": "del consumo",
            "seasonalChart": "Rendimiento Estacional",
```

```
                "monthlyChart": "Producción Mensual",
                "parameter": "Parámetro",
                "value": "Valor",
                "impact": "Impacto en el rendimiento",
                "panelType": "Tipo de panel",
                "inverterEff": "Eficiencia del inversor",
                "temperature": "Pérdida por temperatura",
                "systemLoss": "Pérdida total del sistema",
                "footer1": "Esta calculadora proporciona una estimación
realista. El rendimiento real puede variar debido a condiciones locales.",
                "footer2": "© 2024 Calculadora Universal de Paneles Solares |
Para asesoramiento profesional consulte a un instalador certificado.",
                "months": ["Ene", "Feb", "Mar", "Abr", "May", "Jun", "Jul",
"Ago", "Sep", "Oct", "Nov", "Dic"],
                "seasons": ["Invierno", "Primavera", "Verano", "Otoño"]
            },
            it: {
                "title": "Calcolatore Universale Pannelli Solari",
                "subtitle": "Calcola esattamente la potenza e la resa del tuo
sistema di pannelli solari",
                "inputTitle": "Parametri del Sistema",
                "panelCount": "Numero di pannelli",
                "panelCountHint": "Tipicamente 8-16 per una casa",
                "panelPower": "Potenza per pannello (Wp)",
                "panelPowerHint": "Pannelli moderni: 350-550 Wp",
                "efficiency": "Efficienza sistema (%)",
                "efficiencyHint": "Influenzata da inverter, orientamento &
ombreggiamento",
                "location": "Regione / Irraggiamento solare",
                "locationHint": "Ore di sole medie giornaliere",
                "roofAngle": "Inclinazione & Direzione tetto",
                "roofAngleHint": "Orientamento e angolo del tuo tetto",
                "calculateBtn": "Calcola Resa",
                "infoTitle": "Consigli per resa massima",
                "infoText": "• Orientamento sud (tra sud-est e sud-ovest)<br>•
Angolo d'inclinazione tra 20° e 40°<br>• Installazione senza ombre<br>• Inverter
di qualità per efficienza ottimale",
                "resultsTitle": "Risultati Calcolo",
                "totalPower": "Potenza Totale",
                "yearlyProduction": "Produzione Annuale",
                "dailyProduction": "Produzione Giornaliera (media)",
                "coverageRate": "Tasso di Copertura",
                "ofConsumption": "del consumo",
                "seasonalChart": "Resa Stagionale",
                "monthlyChart": "Produzione Mensile",
                "parameter": "Parametro",
                "value": "Valore",
                "impact": "Impatto sulla resa",
                "panelType": "Tipo pannello",
                "inverterEff": "Efficienza inverter",
                "temperature": "Perdita temperatura",
                "systemLoss": "Perdita sistema totale",
                "footer1": "Questo calcolatore fornisce una stima realistica. La
resa effettiva può variare a causa delle condizioni locali.",
```

```
                "footer2": "© 2024 Calcolatore Universale Pannelli Solari | Per
consulenza professionale consulta un installatore certificato.",
                "months": ["Gen", "Feb", "Mar", "Apr", "Mag", "Giu", "Lug",
"Ago", "Set", "Ott", "Nov", "Dic"],
                "seasons": ["Inverno", "Primavera", "Estate", "Autunno"]
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                "subtitle": "准确计算您太阳能电池板系统的功率和产量",
                "inputTitle": "系统参数",
                "panelCount": "电池板数量",
                "panelCountHint": "通常房屋需要8-16块",
                "panelPower": "每块电池板功率（峰瓦）",
                "panelPowerHint": "现代电池板:350-550峰瓦",
                "efficiency": "系统效率 (%)",
                "efficiencyHint": "受逆变器、方向和阴影影响",
                "location": "地区/太阳辐射",
                "locationHint": "平均日照小时数/天",
                "roofAngle": "屋顶倾斜度和方向",
                "roofAngleHint": "屋顶的方向和角度",
                "calculateBtn": "计算产量",
                "infoTitle": "最大产量提示",
                "infoText": "• 朝南方向(东南和西南之间)<br>• 倾斜角在20°至40°之间
<br>• 确保无阴影安装<br>• 优质逆变器以获得最佳效率",
                "resultsTitle": "计算结果",
                "totalPower": "总功率",
                "yearlyProduction": "年产量",
                "dailyProduction": "日产量(平均)",
                "coverageRate": "覆盖率",
                "ofConsumption": "的消耗量",
                "seasonalChart": "季节性产量",
                "monthlyChart": "月产量",
                "parameter": "参数",
                "value": "数值",
                "impact": "对产量的影响",
                "panelType": "电池板类型",
                "inverterEff": "逆变器效率",
                "temperature": "温度损失",
                "systemLoss": "总系统损失",
                "footer1": "此计算器提供现实估算。实际产量可能因当地条件而异。",
                "footer2": "© 2024 通用太阳能电池板计算器 | 专业建议请咨询认证安装
人员。",
                "months": ["1月", "2月", "3月", "4月", "5月", "6月", "7月", "8月
", "9月", "10月", "11月", "12月"],
                "seasons": ["冬季", "春季", "夏季", "秋季"]
            },
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                "title": "מחשבון פאנלים סולאריים אוניברסלי",
                "subtitle": "חשב בדיוק את ההספק והיבול של מערכת הפאנלים הסולאריים שלך",
                "inputTitle": "פרמטרים של המערכת",
                "panelCount": "מספר הפאנלים",
                "panelCountHint": "בדרך כלל 8-16 לבית",
                "panelPower": "הספק לפאנל (וואט שיא)",
                "panelPowerHint": "פאנלים מודרניים: 350-550 וואט שיא",
```

                    "efficiency": "יעילות המערכת (%)",
                    "efficiencyHint": "מושפע מממיר, כיוון והצללה",
                    "location": "אזור / קרינת שמש",
                    "locationHint": "ממוצע שעות שמש ליום",
                    "roofAngle": "שיפוע וכיוון הגג",
                    "roofAngleHint": "כיוון וזווית הגג שלך",
                    "calculateBtn": "חשב יבול",
                    "infoTitle": "טיפים ליבול מקסימלי",
                    "infoText": "• כיוון דרומי (בין דרום-מזרח לדרום-מערב)
• זווית שיפוע בין 20°
ל-40°
• ודא התקנה ללא הצללה
• ממיר איכותי ליעילות מיטבית",
                    "resultsTitle": "תוצאות חישוב",
                    "totalPower": "הספק כולל",
                    "yearlyProduction": "תפוקה שנתית",
                    "dailyProduction": "תפוקה יומית (ממוצעת)",
                    "coverageRate": "שיעור כיסוי",
                    "ofConsumption": "מהצריכה",
                    "seasonalChart": "יבול עונתי",
                    "monthlyChart": "תפוקה חודשית",
                    "parameter": "פרמטר",
                    "value": "ערך",
                    "impact": "השפעה על היבול",
                    "panelType": "סוג פאנל",
                    "inverterEff": "יעילות ממיר",
                    "temperature": "איבוד טמפרטורה",
                    "systemLoss": "איבוד מערכת כולל",
                    "footer1": "מחשבון זה מספק הערכה מציאותית. היבול בפועל עשוי להשתנות בשל תנאים
מקומיים.",
                    "footer2": "© 2024 מחשבון פאנלים סולאריים אוניברסלי | לייעוץ מקצועי התייעץ עם
מתקין מוסמך.",
                    "months": ["ינו", "פבר", "מרץ", "אפר", "מאי", "יוני", "יולי", "אוג", "ספט", "אוק", "נוב",
"דצמ"],
                    "seasons": ["חורף", "אביב", "קיץ", "סתיו"]
                },
                ar: {
                    "title": "آلة حاسبة الألواح الشمسية العالمية",
                    "subtitle": "احسب بالضبط قدرة وإنتاجية نظام الألواح الشمسية الخاص بك",
                    "inputTitle": "معلمات النظام",
                    "panelCount": "عدد الألواح",
                    "panelCountHint": "عادة 8-16 للمنزل",
                    "panelPower": "القدرة لكل لوح (واط ذروة)",
                    "panelPowerHint": "الألواح الحديثة: 350-550 واط ذروة",
                    "efficiency": "كفاءة النظام (%)",
                    "efficiencyHint": "تتأثر بالعاكس والتوجه والظل",
                    "location": "المنطقة / الإشعاع الشمسي",
                    "locationHint": "متوسط ساعات الشمس يومياً",
                    "roofAngle": "ميل واتجاه السقف",
                    "roofAngleHint": "اتجاه وزاوية سقفك",
                    "calculateBtn": "حساب الإنتاج",
                    "infoTitle": "نصائح لأقصى إنتاج",
                    "infoText": "• توجيه جنوبي (بين الجنوب الشرقي والجنوب الغربي)
• زاوية ميل بين 20°
و40°
• تأكد من تركيب خالٍ من الظل
• عاكس عالي الجودة لكفاءة مثلى",
                    "resultsTitle": "نتائج الحساب",
                    "totalPower": "القدرة الإجمالية",
                    "yearlyProduction": "الإنتاج السنوي",

```
                    "dailyProduction": "الإنتاج اليومي (متوسط)",
                    "coverageRate": "معدل التغطية",
                    "ofConsumption": "من الاستهلاك",
                    "seasonalChart": "الإنتاج الموسمي",
                    "monthlyChart": "الإنتاج الشهري",
                    "parameter": "المعامل",
                    "value": "القيمة",
                    "impact": "التأثير على الإنتاج",
                    "panelType": "نوع اللوح",
                    "inverterEff": "كفاءة العاكس",
                    "temperature": "فقدان الحرارة",
                    "systemLoss": "فقدان النظام الكلي",
                    "footer1": "توفر هذه الآلة الحاسبة تقديرًا واقعيًا. قد يختلف الإنتاج الفعلي بسبب الظروف المحلية.",
                    "footer2": "2024 © آلة حاسبة الألواح الشمسية العالمية | للحصول على المشورة المهنية استشير مُركب معتمد.",
                    "months": ["يناير", "فبراير", "مارس", "أبريل", "مايو", "يونيو", "يوليو", "أغسطس", "سبتمبر",
"أكتوبر", "نوفمبر", "ديسمبر"],
                    "seasons": ["الشتاء", "الربيع", "الصيف", "الخريف"]
                },
                ja: {
                    "title": "ユニバーサル太陽光パネル計算機",
                    "subtitle": "太陽光パネルシステムの電力と発電量を正確に計算",
                    "inputTitle": "システムパラメータ",
                    "panelCount": "パネル数",
                    "panelCountHint": "一般的な家屋:8-16枚",
                    "panelPower": "パネルあたりの電力(峰ワット)",
                    "panelPowerHint": "現代パネル:350-550峰ワット",
                    "efficiency": "システム効率(%)",
                    "efficiencyHint": "インバーター、方位、影の影響を受けます",
                    "location": "地域/日射量",
                    "locationHint": "1日あたりの平均日照時間",
                    "roofAngle": "屋根の傾斜と方角",
                    "roofAngleHint": "屋根の方位と角度",
                    "calculateBtn": "発電量を計算",
                    "infoTitle": "最大発電量のためのヒント",
                    "infoText": "• 南向き(南東と南西の間)<br>• 傾斜角20°～40°<br>• 影の
ない設置を確保<br>• 最適な効率のための高品質インバーター",
                    "resultsTitle": "計算結果",
                    "totalPower": "総電力",
                    "yearlyProduction": "年間発電量",
                    "dailyProduction": "日次発電量(平均)",
                    "coverageRate": "カバレッジ率",
                    "ofConsumption": "消費量の",
                    "seasonalChart": "季節別発電量",
                    "monthlyChart": "月次発電量",
                    "parameter": "パラメータ",
                    "value": "値",
                    "impact": "発電量への影響",
                    "panelType": "パネルタイプ",
                    "inverterEff": "インバーター効率",
                    "temperature": "温度損失",
                    "systemLoss": "総システム損失",
                    "footer1": "この計算機は現実的な推定値を提供します。実際の発電量は現地の
条件により異なる場合があります。",
```

```
                    "footer2": "© 2024 ユニバーサル太陽光パネル計算機 | 専門的なアドバイスに
ついては認定設置業者にご相談ください。",
                    "months": ["1月", "2月", "3月", "4月", "5月", "6月", "7月", "8月
", "9月", "10月", "11月", "12月"],
                    "seasons": ["冬", "春", "夏", "秋"]
            }
        };

        // ============================================
        // GLOBAL VARIABLES
        // ============================================

        let currentLanguage = 'nl';
        let seasonChart = null;
        let monthlyChart = null;
        const rtlLanguages = ['he', 'ar'];

        // ============================================
        // TRANSLATION FUNCTIONS
        // ============================================

        function changeLanguage(lang) {
            currentLanguage = lang;

            // Update active button
            document.querySelectorAll('.lang-btn').forEach(btn => {
                btn.classList.remove('active');
                if (btn.getAttribute('data-lang') === lang) {
                    btn.classList.add('active');
                }
            });

            // Update RTL class
            document.body.classList.remove('rtl');
            if (rtlLanguages.includes(lang)) {
                document.body.classList.add('rtl');
            }

            // Translate all elements
            translatePage();

            // Recalculate and update charts
            if
(document.getElementById('calculateBtn').hasAttribute('data-calculated')) {
                calculateResults();
            }
        }

        function translatePage() {
            // Translate all elements with data-i18n attribute
            const elements = document.querySelectorAll('[data-i18n]');
            elements.forEach(element => {
                const key = element.getAttribute('data-i18n');
                if (translations[currentLanguage] &&
```

```
translations[currentLanguage][key]) {
                    // Check if element is input placeholder or normal element
                    if (element.tagName === 'INPUT' || element.tagName ===
'TEXTAREA' || element.tagName === 'SELECT') {
                        element.placeholder =
translations[currentLanguage][key];
                    } else if (element.hasAttribute('data-i18n-html')) {
                        element.innerHTML = translations[currentLanguage][key];
                    } else {
                        element.textContent =
translations[currentLanguage][key];
                    }
                }
            });

            // Update page title
            document.title = translations[currentLanguage]['title'];

            // Update select options (for location and roof angle)
            updateSelectOptions();
        }

        function updateSelectOptions() {
            // This function would update dynamic select options if needed
            // For now, we keep the options as they are in HTML
        }

        // ============================================
        // CALCULATION FUNCTIONS
        // ============================================

        function calculateResults() {
            // Get input values
            const panelCount =
parseInt(document.getElementById('panelCount').value) || 12;
            const panelPower =
parseInt(document.getElementById('panelPower').value) || 400;
            const efficiency =
parseInt(document.getElementById('efficiency').value) || 85;
            const locationFactor =
parseFloat(document.getElementById('location').value) || 1.05;
            const roofFactor =
parseFloat(document.getElementById('roofAngle').value) || 1.0;

            // Update efficiency value display
            document.getElementById('efficiencyValue').textContent = efficiency
+ '%';

            // Calculate total power in kWp
            const totalPowerWp = panelCount * panelPower;
            const totalPowerKw = totalPowerWp / 1000;

            // Calculate annual production (kWh)
            // Base formula: kWp * location factor * roof factor * efficiency *
```

```
1000 (kWh per kWp in ideal conditions)
            const baseProduction = totalPowerKw * 1000; // Base in ideal
conditions (1000 kWh per kWp)
            const annualProduction = Math.round(baseProduction * locationFactor
* roofFactor * (efficiency / 100));

            // Calculate daily average production
            const dailyProduction = (annualProduction / 365).toFixed(1);

            // Estimate coverage rate (based on average Dutch household
consumption of 3500 kWh)
            const averageConsumption = 3500;
            const coverageRate = Math.round((annualProduction /
averageConsumption) * 100);

            // Update result displays
            document.getElementById('totalPower').textContent =
totalPowerKw.toFixed(1);
            document.getElementById('yearlyProduction').textContent =
annualProduction.toLocaleString(currentLanguage);
            document.getElementById('dailyProduction').textContent =
dailyProduction;
            document.getElementById('coverageRate').textContent = coverageRate +
'%';

            // Update comparison table values
            updateComparisonTable(panelPower, efficiency);

            // Generate charts
            generateCharts(annualProduction, locationFactor, roofFactor,
efficiency);

            // Mark as calculated

document.getElementById('calculateBtn').setAttribute('data-calculated', 'true');
        }

        function updateComparisonTable(panelPower, efficiency) {
            // Determine panel type based on power
            let panelType = "Polykristallijn";
            let panelImpact = "Standaard";

            if (panelPower >= 450) {
                panelType = "Monokristallijn";
                panelImpact = currentLanguage === 'nl' ? "+15% t.o.v. poly" :
"+15% vs poly";
            } else if (panelPower >= 400) {
                panelType = "PERC Mono";
                panelImpact = currentLanguage === 'nl' ? "+10% t.o.v. poly" :
"+10% vs poly";
            }

            // Inverter efficiency (depends on system efficiency)
            let inverterEff = "96%";
```

```javascript
            let inverterImpact = currentLanguage === 'nl' ? "Hoog (±3% verlies)"
: "High (±3% loss)";

            if (efficiency >= 90) {
                inverterEff = "98%";
                inverterImpact = currentLanguage === 'nl' ? "Zeer hoog (±2%
verlies)" : "Very high (±2% loss)";
            } else if (efficiency <= 80) {
                inverterEff = "94%";
                inverterImpact = currentLanguage === 'nl' ? "Gemiddeld (±5%
verlies)" : "Average (±5% loss)";
            }

            // Temperature loss (seasonal)
            const tempLoss = "-8%";
            const tempImpact = currentLanguage === 'nl' ? "Gemiddeld (zomer)" :
"Average (summer)";

            // Total system loss
            const systemLoss = (100 - efficiency) + "%";
            const systemImpact = currentLanguage === 'nl' ? "Normaal voor
installatie" : "Normal for installation";

            // Update table
            document.getElementById('panelTypeValue').textContent = panelType;
            document.getElementById('panelTypeImpact').textContent =
panelImpact;
            document.getElementById('inverterEffValue').textContent =
inverterEff;
            document.getElementById('inverterEffImpact').textContent =
inverterImpact;
            document.getElementById('temperatureValue').textContent = tempLoss;
            document.getElementById('temperatureImpact').textContent =
tempImpact;
            document.getElementById('systemLossValue').textContent = systemLoss;
            document.getElementById('systemLossImpact').textContent =
systemImpact;
        }

        function generateCharts(annualProduction, locationFactor, roofFactor,
efficiency) {
            // Get translated month names
            const months = translations[currentLanguage]?.months || ["Jan",
"Feb", "Mar", "Apr", "May", "Jun", "Jul", "Aug", "Sep", "Oct", "Nov", "Dec"];
            const seasons = translations[currentLanguage]?.seasons || ["Winter",
"Spring", "Summer", "Autumn"];

            // Generate monthly distribution (simplified model)
            const monthlyDistribution = [
                0.05, 0.06, 0.09, 0.12, 0.15, 0.16, 0.16, 0.13, 0.09, 0.05,
0.03, 0.02
            ];

            const monthlyData = monthlyDistribution.map(value =>
```

```
Math.round(value * annualProduction));

            // Generate seasonal data
            const seasonalDistribution = [0.11, 0.36, 0.44, 0.09]; // Winter,
Spring, Summer, Autumn
            const seasonalData = seasonalDistribution.map(value =>
Math.round(value * annualProduction));

            // Destroy existing charts
            if (seasonChart) seasonChart.destroy();
            if (monthlyChart) monthlyChart.destroy();

            // Create seasonal chart (pie)
            const seasonCtx =
document.getElementById('seasonChart').getContext('2d');
            seasonChart = new Chart(seasonCtx, {
                type: 'pie',
                data: {
                    labels: seasons,
                    datasets: [{
                        data: seasonalData,
                        backgroundColor: [
                            '#3498db', // Winter - blue
                            '#2ecc71', // Spring - green
                            '#f39c12', // Summer - orange
                            '#9b59b6'  // Autumn - purple
                        ],
                        borderWidth: 2,
                        borderColor: '#fff'
                    }]
                },
                options: {
                    responsive: true,
                    maintainAspectRatio: false,
                    plugins: {
                        legend: {
                            position: 'right',
                            labels: {
                                padding: 20,
                                usePointStyle: true,
                                font: {
                                    size: 12
                                }
                            }
                        },
                        tooltip: {
                            callbacks: {
                                label: function(context) {
                                    const label = context.label || '';
                                    const value = context.raw || 0;
                                    const percentage = Math.round((value /
annualProduction) * 100);
                                    return `${label}:
${value.toLocaleString(currentLanguage)} kWh (${percentage}%)`;
```

```
                                    }
                                }
                            },
                            datalabels: {
                                color: '#fff',
                                font: {
                                    weight: 'bold',
                                    size: 12
                                },
                                formatter: (value) => {
                                    return Math.round((value / annualProduction) *
100) + '%';
                                }
                            }
                        }
                    },
                    plugins: [ChartDataLabels]
            });

            // Create monthly chart (bar)
            const monthlyCtx =
document.getElementById('monthlyChart').getContext('2d');
            monthlyChart = new Chart(monthlyCtx, {
                type: 'bar',
                data: {
                    labels: months,
                    datasets: [{
                        label: currentLanguage === 'nl' ? 'Opbrengst (kWh)' :
'Yield (kWh)',
                        data: monthlyData,
                        backgroundColor: 'rgba(52, 152, 219, 0.7)',
                        borderColor: 'rgba(52, 152, 219, 1)',
                        borderWidth: 1,
                        borderRadius: 5
                    }]
                },
                options: {
                    responsive: true,
                    maintainAspectRatio: false,
                    plugins: {
                        legend: {
                            display: false
                        },
                        tooltip: {
                            callbacks: {
                                label: function(context) {
                                    const value = context.raw || 0;
                                    return
`${value.toLocaleString(currentLanguage)} kWh`;
                                }
                            }
                        }
                    },
                    scales: {
```

```
                    y: {
                        beginAtZero: true,
                        title: {
                            display: true,
                            text: 'kWh'
                        },
                        ticks: {
                            callback: function(value) {
                                return
value.toLocaleString(currentLanguage);
                            }
                        }
                    },
                    x: {
                        grid: {
                            display: false
                        }
                    }
                }
            }
        });
    }

    // ==========================================
    // INITIALIZATION
    // ==========================================

    document.addEventListener('DOMContentLoaded', function() {
        // Initialize language buttons
        document.querySelectorAll('.lang-btn').forEach(btn => {
            btn.addEventListener('click', function() {
                changeLanguage(this.getAttribute('data-lang'));
            });
        });

        // Initialize calculate button
        document.getElementById('calculateBtn').addEventListener('click',
calculateResults);

        // Initialize efficiency slider
        const efficiencySlider = document.getElementById('efficiency');
        const efficiencyValue = document.getElementById('efficiencyValue');

        efficiencySlider.addEventListener('input', function() {
            efficiencyValue.textContent = this.value + '%';
        });

        // Initialize with default language and calculate
        changeLanguage('nl');
        calculateResults();

        // Add auto-calculation on input change
        const inputs = document.querySelectorAll('.input-section input,
.input-section select');
```

```
            inputs.forEach(input => {
                input.addEventListener('change', calculateResults);
                input.addEventListener('input', function() {
                    if (this.type === 'range') {
                        efficiencyValue.textContent = this.value + '%';
                    }
                    if
(document.getElementById('calculateBtn').hasAttribute('data-calculated')) {
                        calculateResults();
                    }
                });
            });
        });
    </script>
</body>
</html>
```