Phase 5: Apex Programming (Developer)

■ Objective

Introduce Apex programming in Salesforce to extend the GreenForce Sustainability Platform with custom logic, triggers, and reusable services beyond declarative automation.

Step 1: Apex Triggers

Automate logic on database events where Flows may be limited.
Use Case: Auto-calculate Initiative Impact when new Emissions__c records are added.
Example Trigger:
- Object: Emissions__c
- Event: After Insert/Update
- Action: Sum all CO2e__c linked to the Initiative and update Initiative's Impact_Score__c.

Step 2: Apex Classes (Reusable Services)

Encapsulate business logic in Apex classes for reusability.
Class Example: GreenForceImpactCalculator.cls
Methods:
- calculateInitiativeImpact(Id initiativeId) → Returns updated score.
- sendHighEmissionAlert(Emissions__c emission) → Sends custom notification.

Step 3: Batch Apex

Handle large datasets for reporting & compliance.
Use Case: Monthly recalculation of all initiatives' impact.
- BatchGreenForceImpact.cls runs asynchronously.
- Benefits: Scales for 50k+ records, avoids governor limits.

Step 4: Scheduled Apex

Schedule recurring jobs.
Example: Run BatchGreenForceImpact every month.
Setup: System.schedule('Monthly Impact Job', cronExpression, new BatchGreenForceImpact());

Step 5: Apex REST API

Expose sustainability data to external systems.
Example: /services/apexrest/GreenForce/v1/emissions/
Allows suppliers to push emissions data from ERP/IoT systems.

Step 6: Test Classes

Salesforce requires ≥75% code coverage for deployment.
- Write unit tests for Triggers, Classes, Batch, and REST services.
- Example: GreenForceImpactCalculator_Test.cls validates calculations with mock data.

Step 7: Security & Best Practices

- Use with sharing classes to enforce record-level security.
- Avoid SOQL/DML inside loops.
- Bulkify triggers to handle multiple records.
- Store thresholds/config values in Custom Metadata instead of hardcoding.

Deliverables

- Apex Triggers for Initiatives & Emissions
- Apex Classes (Impact Calculator, Alerts)
- Batch & Scheduled Apex jobs
- Apex REST API for external integrations
- Unit Tests ensuring >75% coverage
- Deployment-ready code following Salesforce best practices

■ By end of Phase 5, GreenForce will have a scalable, developer-extended architecture with Apex, ready for enterprise-level sustainability management.