ST10500838 - EAPD7111 POE PART 2

AgriEnergyConnect (Prototype) — .NET 8

This document serves as the official technical report for the AgriEnergyConnect prototype system, developed for the EAPD7111 Programming for Online Environment (POE) Part 2. The project implements a web-based management solution connecting Farmers and Employees in the Agri-Energy sector, with full authentication, database integration, and responsive UI using ASP.NET Core 8 and Entity Framework Core.

1. System Overview

AgriEnergyConnect is a role-based web application designed to enhance collaboration between farmers and employees in agricultural and energy sectors. The system provides secure authentication, data management, and user-friendly interfaces for efficient operations.

2. Core Functionalities

Authentication & Authorization	**ASP.NET Identity with Farmer and Employee roles.**
Farmer Dashboard	Add and manage product records linked to each farmer profile.
Employee Dashboard	Add new farmers, view and filter products across all farmers.
Database Integration	SQL Server with EF Core ORM and seeding of users, roles, and data.
UI/UX Design	Bootstrap 5 responsive layout, dark mode, icons, and animations.

3. Technologies Used

• ASP.NET Core 8 (MVC Pattern) • Entity Framework Core 8 • SQL Server (LocalDB or Azure SQL) • Bootstrap 5.3 + Bootstrap Icons • C# and Razor Views • Visual Studio / Visual Studio Code

4. Database Design

The system uses a relational SQL Server database with the following entities: - ApplicationUser (Identity) - Farmer - Product Relationships: One Farmer → Many Products. Seeding includes default roles (Employee, Farmer) and demo accounts for testing.

5. User Roles and Access

- Employee: Can add new farmers, view and filter all products. - Farmer: Can manage only their own products. - Both roles authenticate through the login interface with validation of assigned role.

6. System Flow

1. User logs in with email and password. 2. System validates credentials and role (Farmer or Employee). 3. Redirects user to appropriate dashboard. 4. Farmer can add/view their products. 5. Employee can add farmers and manage product visibility.

7. UI and UX Highlights

The interface is clean, responsive, and designed with a professional color palette: - Green primary theme for sustainability context. - Animated transitions on buttons and modals. - Spinner loading effects for Login and CRUD operations. - Dark mode toggle available globally.

8. Testing and Validation

The application was tested for: - Login and logout for both roles. - CRUD operations for Products and Farmers. - Role-based access control enforcement. - Database creation and seeding validation. All functionalities passed successfully in local and SQL Server test environments.

9. Deployment

The project runs locally on ports https://localhost:7001 and http://localhost:7000. It can be deployed to Azure App Service or IIS using standard ASP.NET deployment procedures.

10. Conclusion

AgriEnergyConnect successfully fulfills the POE Part 2 requirements, demonstrating secure, functional, and user-friendly web application design using modern .NET practices. The system showcases a complete solution integrating identity, data management, and responsive UI.