Agrivoltaic Scheme.

1. Regulatory and scheme alignment

- **CEB CAV II scheme compliance: Requirement:** Confirm project falls under CEB Agrivoltaics (CAV) II Scheme (500 kWac–4 MWac, hybrid PV+BESS, registered planter/farmer or cooperative).
- **Eligibility of project developer: Requirement:** Evidence of registration as planter/farmer; cooperative registration documents if applicable.
- **Scheme documentation: Requirement:** Latest CAV II Information Leaflet, amendments (May/June/July 2026), and Connection & Energy Purchase Agreement (CEPA) incorporated into design basis.
- **Land-use and planning permits: Requirement:** Local authority planning consent, land zoning confirmation (agricultural vs other), building/works permits, environmental licences where applicable.
- **Agricultural authority approvals: Requirement:** Alignment with national food-security objectives; approvals from relevant agricultural bodies for dual-use land.

2. Grid connection and electrical requirements

- **Network Impact Assessment (NIA): Requirement:** Submit preliminary design data (capacity, location, single-line diagram, export profile) to CEB for NIA; integrate all NIA recommendations into detailed design.
- **Point of Delivery (PoD) definition: Requirement:** Confirm PoD voltage level, fault level, and protection coordination with CEB; design MV substation and interconnection accordingly.
- **Grid code compliance: Requirement:** Adherence to CEB grid codes for voltage, frequency, reactive power, ramp rates, fault-ride-through, and power-quality limits.
- **Export limitation and dispatch rules: Requirement:** Implement control schemes to respect any CEB-imposed export caps, curtailment instructions, and BESS dispatch rules.
- **Metering and protection: Requirement:** Revenue-grade metering, protection relays, islanding protection, and communication interfaces per CEB standards.

3. Battery energy storage system (BESS) requirements

- **Minimum BESS sizing per CAV II: Requirement:** BESS sized for at least **2 hours at half of the AC output capacity** of the facility (e.g., 4 MWac PV → ≥4 MWh at 2 MW).
- **Operating philosophy: Requirement:** Define charge/discharge strategy (peak-shaving, firming, evening supply), cycling limits, and state-of-charge windows.
- **Integration with PV and grid: Requirement:** EMS/SCADA architecture, control hierarchy (PV inverters, BESS PCS, plant controller), and communication with CEB dispatch centre.
- **Safety and standards: Requirement:** Compliance with IEC/IEEE standards for BESS, fire detection/suppression, ventilation, and emergency procedures.

4. Agronomic and land-use design requirements

- **Crop selection and agronomic model: Requirement:** Identify target crops/livestock; agronomic study on shading tolerance, water needs, and yield under PV structures.

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- **Layout for dual use: Requirement:** Row spacing, module height, and structure geometry to allow machinery access, irrigation, and human/animal movement.
- **Soil and water management: Requirement:** Soil analysis, drainage design, erosion control, and irrigation integration (including potential use of PV power for pumping).
- **Microclimate assessment: Requirement:** Evaluate impact of PV shading on temperature, humidity, and wind; design to optimise both energy and agricultural yield.
- **Operational interfaces: Requirement:** Clear demarcation of agricultural vs electrical safety zones; procedures for farmers working under/around PV structures.

5. PV plant technical design requirements (≤4 MWac)

- **Capacity definition: Requirement:** Target AC capacity (up to 4 MWac) and DC/AC ratio; technology choice (fixed-tilt vs trackers, bifacial vs monofacial).
- **Resource and yield assessment: Requirement:** Solar resource data (GHI/DNI, temperature), shading analysis, expected specific yield, and performance ratio.
- **Electrical design: Requirement:** String configuration, inverter sizing, cable routing compatible with agricultural operations, earthing, and lightning protection.
- **Civil and structural design: Requirement:** Foundations suitable for agricultural soil, corrosion protection, wind-load and cyclone-resilience design, access roads and fencing.
- **SCADA and monitoring: Requirement:** Plant-level monitoring, fault detection, data logging for both energy and agronomic KPIs.

6. Environmental, social, and safety requirements

- **Environmental impact assessment (EIA) / screening: Requirement:** Evaluate impacts on biodiversity, water, landscape, and neighboring communities; mitigation measures where required.
- **Health and safety plan: Requirement:** H&S risk assessment for construction and operation, including coexistence of farm workers and electrical infrastructure.
- **Community and stakeholder engagement: Requirement:** Consultation with local communities, landowners, and authorities; grievance and communication mechanisms.

7. Commercial, legal, and contractual requirements

- **Land tenure and rights: Requirement:** Long-term land lease/ownership documents, rights of way, and easements for grid connection.
- **CEPA and tariff framework: Requirement:** Connection & Energy Purchase Agreement terms, tariff structure, penalties, and performance obligations under CAV II.
- **Insurance and risk allocation: Requirement:** Construction and operational insurance, force-majeure clauses, and allocation of agricultural vs energy risks.
- **Project financing inputs: Requirement:** CAPEX/OPEX estimates, revenue modelling (energy + potential agricultural premium), and bankability assumptions.

8. Detailed design deliverables

- **Design basis report: Requirement:** Document summarising all regulatory, technical, agronomic, and commercial assumptions and standards.
- **Drawings and models: Requirement:** Site layout, electrical single-line diagrams, civil/structural drawings, agronomic layout plans.
- **Technical specifications: Requirement:** Equipment datasheets, installation standards, testing and commissioning procedures.
- **Integrated O&M plan: Requirement:** Joint PV–agriculture O&M strategy, access rules, maintenance windows, and performance monitoring framework.