

Requirements and Strategy

In this document we need to add in any ideas or things we need completed or have completed. Write down in this document so Noah can put it into the official logs and reports documentation and we can put forward ideas or progress or anything needing changed and raise those ideas to the lead of the lead of the team it affects and also the project lead. We can use this document to track progress and also make sure we are putting hours into the right places and stay on track to creating a working prototype by week 5 and also a fully completed project by the end of this term to present.

Write anything in this format:

“Ayush came up with the idea to use [THREE.js](#) for scrolling animations for the front end, to create a better looking front end - he asked Flynn as he is Front End lead and they had a discussion about the tradeoffs of using it and if it can be implemented with react. They decided together that Ayush could start working on the homepage with [THREE.js](#) “
-19/01/26

Main requirements

Thomas had a look through the requirements of the project and what the PDF says are the main requirements of “Campus Carbon Challenge Game and Dashboard” based on the specification. Listed below are the things that need to be completed:

We **need** all of these features as required by the spec:

- Personal missions: small actions logged by individuals (e.g., ‘cycled to campus’, ‘ate vegetarian meal’).
- Group challenges: teams compete (e.g., halls or societies) based on total verified points or estimated CO2 saved.
- Badges: earned for milestones (streaks, variety of actions, evidence submission).
- Season leaderboard: overall points across the term.

Profile requirements:

Users:

- Create a profile (non-sensitive info), join a group, and log actions.
- Join challenges, see mission feedback, and view personal progress dashboards.
- Upload evidence where required (e.g., photo of reusable cup) with clear privacy guidance.

Organisers/moderators:

- Create and manage challenges (rules, points, evidence requirements, start/end dates)
- Review flagged submissions and moderate disputes (approve/reject with a reason)
- View analytics (participation rates, common failure reasons)

Maintainers/Developers (Us):

- Maintain data models, calculations, deployments, and testing

Feature requirements:

- Action logging: users log actions against a taxonomy (travel, food, energy, waste)
 - Need to have a taxonomy set up for the system as a whole for all actions
- Carbon estimation: the system converts actions into CO₂e saved (or emitted) using explicit conversion factors and assumptions.
 - Mathematical model
- Challenge participation: users join challenges and submit actions to earn points; the system applies scoring rules
- Evidence and verification: some actions must require evidence (configurable by challenge) and go through moderation.
- Dashboards: personal dashboard (actions, points, CO₂e trend) and group dashboard (leaderboards, participation)
- Transparency: for each action, show the factor(s) used and a short explanation of the calculation.

Challenge requirements:

- At least 8 challenges seeded (mix of personal and group challenges)
- At least 4 challenges must require evidence and moderation decisions.
- Moderation workflow must track: submission status, moderator decision, decision reason, and timestamps.
- Anti-gaming checks: at least 6 checks such as duplicate submissions, unrealistic frequency, or contradictory logs

Data visualisation:

- At least 6 dashboard views across the system (e.g., weekly CO2e, action breakdown by category, group leaderboard, verification rate).
- At least 2 views must include uncertainty or caveats (e.g., ranges, disclaimers, confidence levels).
- Users must be able to filter by date range and category

Technical requirements:

- Authentication: role-based access control (participant/moderator).
- Security: secrets via environment variables; no secrets in repository or ELE ZIP; protect uploaded evidence files.
- Accessibility: keyboard navigation for core screens, readable contrast, and mobile-friendly layouts.
- Professional practice evidence: use GitHub commits/issues/PRs; the repository URL must be included in 0_admin/submission.txt.
- Testing (mandatory): you must submit BOTH (A) an automated test suite that can be executed by the markers, AND (B) a manual end-to-end test plan with results evidence.
 - Automated tests (A) must include at least 15 automated tests covering: authentication/authorisation, action logging, carbon calculation correctness, challenge scoring, moderation workflow, and dashboards/filters.
 - Manual tests (B) must include at least 8 end-to-end scenarios (happy path + failure cases). Include expected results and screenshots/logs of completed runs in 4_technical/testing_evidence.pdf.

- We also need a deployment_guide.pdf that must include a 'How to run tests' section with the exact commands/steps.

Seeded Data:

- We must include a seeded dataset so the system works during marking without requiring external data
- At least 500 action logs seeded across at least 60 users and 10 groups (synthetic data is acceptable)
- At least 8 challenges (as above) with at least 200 challenge submissions across them
- At least 80 evidence submissions seeded and at least 40 moderation decisions seeded
- A conversion factor table for CO2e calculations (with sources recorded in your report)
- At least 100 pre-seeded 'edge case' submissions to test anti-gaming checks and moderation.

Example of suggested data fields and entities:

Entity	Key fields (minimum)
User	user_id, role, display_name, group_id, settings
Group	group_id, name, type (hall/society/class), members
ActionType	action_type_id, category, name, unit, default_factor_id
ConversionFactor	factor_id, source, unit_in, unit_out, value, notes, uncertainty(optional)
ActionLog	log_id, user_id, action_type_id, quantity, date, evidence_required, calculated_co2e, confidence
Challenge	challenge_id, title, scope (personal/group), rules, scoring, start/end dates
Submission	submission_id, challenge_id, user_id/group_id, linked_action_logs, points, status
ModerationDecision	decision_id, submission_id, moderator_id, decision, reason, timestamp
AntiGamingFlag	flag_id, submission_id, flag_type, rule_triggered, status

What we NEED done by week 5:

Sprint 1 deliverable expectations

- Prototype v0.1.0 (vertical slice): user logs an action → sees transparent carbon calculation → submits to a challenge → points awarded → dashboard updates.
- Moderator workflow: demonstrate one evidence-required submission being approved/rejected with a reason.
- Testing evidence (CW1): include at least 5 automated tests running successfully and document how to run them in `deployment_guide.pdf`; include one manual end-to-end test run with evidence in `testing_evidence.pdf`.
- Prototype report must include: executive summary, prioritised requirements, architecture v1, factor model design, initial evaluation evidence, and a sprint plan for CW2.
- Ethical/legal considerations must cover privacy for evidence uploads, data retention, fairness/incentives, accessibility, and IP/licensing implications.
- Software/data inventory must list all dependencies and datasets (licence, provenance, cost model, versions).