Karica — MVP

*Karica is the app that lets you join the green energy revolution from your own living room.*

# 0. Product Manifesto

Karica is the app for green, shared energy that helps people make smarter decisions about how they use, save, and invest in energy at home and in their communities.

Karica brings together in one place:

* tools to understand your energy profile and how you actually consume;
* tailored options for savings and investment (CERs, efficiency measures, home automation scenarios);
* bonuses, incentives, financing and partner offers, all presented in a simple, comparable way.

The experience is:

* **Simple and transparent** – clear language, no hidden conditions, no “energy jargon” unless strictly necessary and always explained.
* **Secure and integrated** – strong identity and consent management, compliant data handling, and integrations with trusted, certified partners only.
* **Action-oriented** – the app doesn’t just show data; it proposes concrete next steps: join a CER, request an intervention, activate automations, share your impact.

Karica reduces bureaucracy and fragmentation: documents, simulations, offers, and statuses are accessible from a single interface instead of multiple portals and PDFs.  
Users join a modern, “smart” energy community where they can:

* track their impact,
* take part in missions and challenges,
* invite friends,
* earn tokens and redeem rewards.

Karica’s goal is not only to cut bills, but to make users active players in the energy transition.

# 0.1 MVP Guiding Principles

These principles govern every feature and UX decision in the MVP.

1. **Radical simplification**
   * Step-by-step flows, one decision per screen where possible.
   * Clear, everyday language; unavoidable technical terms are explained inline (“What does this mean?”).
   * Default paths are designed for non-experts; advanced details are available but never block progress.
2. **Privacy by design**
   * Only collect what is necessary for each use case, with a clear explanation of “why”.
   * Granular, revocable consents (monitoring, communications, marketing, partner sharing, etc.), managed from a dedicated consent center.
   * All flows and data structures must be reviewable and approvable by the DPO; onboarding must be usable even with the minimum required consents.
3. **Perceived value in days, not months**
   * Within a few days of onboarding, users must see tangible value:
     + a personalized simulation or savings potential quickly after providing their bill/data;
     + first concrete insights and recommendations (e.g., CER eligibility, suggested interventions, behavioral tips).
   * Within the first available billing/monthly cycle, users must see at least one “real” (not purely simulated) result or confirmation (e.g., first CER statement, first measured savings).
4. **Radical transparency of numbers and models**
   * Every number in the app must be explainable and traceable:
     + clear distinction between estimates and actuals;
     + visible assumptions (prices, production profiles, load profiles, incentives, discount rates);
     + versioning of models and calculators used;
     + explicit description of how interventions are financed (loans, grants, tax bonuses, partner margins) and of payback time.
   * Users must always be able to see “How we calculate this” from any KPI.
5. **No forced supplier switch**
   * Joining a Renewable Energy Community (CER) or using other Karica services must never require an automatic or mandatory change of energy supplier.
   * Karica is additive to the user’s existing situation: the CER and efficiency actions are layered on top, not tied to a specific retailer lock-in by design.
   * Any optional supplier change or partner contract must be explicitly explained as such, with clear pros/cons and no dark patterns.

These principles should be treated as non-negotiable constraints for the MVP: if a feature conflicts with them, the feature must be redesigned or postponed.

# Digital Flow

# A) UX & technical compliance check vs Octopus & Revolut

**Summary verdict**

* The core flows (onboarding, usage charts, CER join, quotes, gamification) are aligned with current consumer-fintech and energy-utility UX.
* Gaps to close before build: explicit global navigation model, accessible color contrasts for brand colors, motion/animation system, “reduce motion” handling, empty/loading/error state standards, consent center, and drill-down analytics parity.

**Where you’re already aligned**

* **Tap-to-drill charts & period comparisons** for usage and savings mirror Octopus’ “tap each bar to see time & usage/price” and day/half-hour patterns.
* **“How it’s calculated” links** and **clear KPI cards** are consistent with consumer finance patterns like Revolut’s analytics dashboard and widgets.
* **Progressive identity & notifications** in CER onboarding echo Revolut’s pattern of driving KYC via in‑app banners + push.

**Gaps & concrete fixes**

1. **Global navigation model (required):** add a 5‑tab bottom bar: Home, Monitor, CER, Actions, Profile. Revolut locates analytics from Home top-right and keeps navigation shallow; imitate that simplicity.
2. **Color accessibility (required):** your brand colors fail AA in some combinations; see Chapter 00 for corrected tokens (primary‑700/secondary‑700) and usage rules based on WCAG 2.2.
3. **Motion system (required):** define durations/easings (150–250 ms; standard/decel curves) and implement “Reduce Motion” fallbacks per Material 3 and Apple HIG.
4. **Loading/empty/error states (required):** add skeletons, optimistic UI for OCR and CER status, actionable empty states.
5. **Consent center (required):** beyond checkboxes in onboarding, provide a persistent privacy/consent management screen to edit/revoke consents (GDPR good practice).
6. **Analytics depth (nice‑to‑have):** add “Net cashflow style” energy cashflow summary (spent vs saved) analogous to Revolut’s “Net cashflow” widget.
7. **Dynamic tariffs nudges (nice‑to‑have):** time‑of‑use tips and notifications akin to Octopus usage guidance (shift to cheaper/off‑peak slots).

# 00) Global product & design baseline (for Lovable)

**00.1 Brand & color system (light/dark, accessible)**

Provided brand colors: **white**, **black**, **#DE4893**, **#FCC113**.

**Contrast facts (WCAG 2.2):**

* **#DE4893 on white**: contrast ≈ **3.85:1** → **fails** AA for normal text; OK for large text (≥18 pt regular or ≥14 pt bold).
* **#DE4893 on black**: ≈ **5.45:1** → **passes** AA.
* **#FCC113 on white**: ≈ **1.64:1** → **fails** AA.
* **#FCC113 on black**: ≈ **12.78:1** → **passes** AA.  
  Reference thresholds: 4.5:1 (normal), 3:1 (large).

**Accessible tokens (use these in UI, keep originals for accents/illustration):**

* --color-primary-500: #DE4893 (brand accent; use on **dark** surfaces or for large headings/buttons only)
* --color-primary-700: #C02278 (**use for text/icon on white**; AA compliant)
* --color-secondary-500: #FCC113 (brand accent; use on **dark** surfaces, chips, highlights)
* --color-secondary-700: #996C00 (**use for text/icon on white**; AA compliant)
* Neutrals (example set):
  + --neutral-900: #0A0A0A, --neutral-800: #1F2023, --neutral-700: #2A2C31,
  + --neutral-500: #6B7280, --neutral-300: #D1D5DB, --neutral-100: #F3F4F6, --neutral-0: #FFFFFF
* Status: --success-600: #12B76A, --warning-600: #F79009, --error-600: #D92D20

**Light/Dark usage rules**

* On **light** surfaces: prefer primary-700 / secondary-700 for text/icons; keep primary‑500/secondary‑500 for fills, large buttons, or illustration.
* On **dark** surfaces: primary‑500 and secondary‑500 pass; ensure button text is #FFFFFF.
* Maintain minimum **4.5:1** for text; **3:1** for large text and UI components.

**00.2 Typography**

* Base size **16**. Scale: 12, 14, 16, 20, 24, 32, 40.
* Families: system defaults for performance and platform fit: **SF Pro** (iOS), **Roboto** (Android), **Inter** (web).
* Weights: Regular, Medium (body), Semibold (headings/buttons).
* Line-height: 1.4–1.6 for body; 1.2–1.3 for headings.

**00.3 Spacing, elevation, radius**

* **8‑pt grid**; spacing tokens 4/8/12/16/24/32.
* Card radius **12**; chip radius **999**.
* Elevation: 0/1/2/4/8 (dp); avoid heavy shadows in light mode.

**00.4 Motion & transitions**

* Durations: **150–200 ms** for micro‑interactions; **200–300 ms** for page transitions.
* Easings: standard/deceleration curves as per Material; spring only for delight cases.
* **Respect system “Reduce Motion”**; provide non‑animated equivalents.

**00.5 Accessibility (WCAG 2.2 AA)**

* Contrast per tokens above; **target size ≥44×44 dp**, **focus not obscured**, **dragging alternatives**, **redundant entry**, and **accessible authentication** coverage.
* VoiceOver/TalkBack labels for charts (aggregate + selected bar/point values).
* **Haptics**: light impact for success, warning for failures.

**00.6 Privacy, security, GDPR**

* **Consent center** in Profile: view/revoke consents; granular toggles.
* Data minimization; legal basis documented per collection; no pre‑ticked boxes.
* Storage: encrypt at rest; redact PII from OCR logs; scoped, time‑boxed retention.
* 2FA default; SPID/eID-based strong ID for CER when required.

**00.7 Platforms & navigation**

* Platforms: iOS/Android (phone first).
* **Bottom tab bar (5):** Home, Monitor, CER, Actions, Profile. Keep drill depth ≤2.
* Place analytics shortcut in Home top-right (as Revolut does).

**00.8 Content design**

* Crisp, verb-first labels; no jargon.
* Empty states are actionable; loading uses skeletons; errors include recovery action.

# 01) Onboarding & account creation with bill upload

**Feature ID** F01 – Onboarding with bill (OCR)

**Goal**

* Create an account fast, capture POD & consumption from a bill, check CER eligibility, and minimize drop‑off.

**Actors**

* Private user; SME (multi‑POD).

**Data model**

* User(id, email, phone, type, password\_hash, twoFA\_enabled)
* OnboardingSession(id, user\_id, source, status)
* EnergyPoint(id, user\_id, pod\_code, supplier, address, usage\_kwh\_y, period\_start, period\_end, type)
* BillUpload(id, user\_id, file\_url, ocr\_status, ocr\_confidence)
* Consent(id, user\_id, kind, status, timestamp)
* CEREligibilityCheck(id, user\_id, pod\_id, outcome, notes)

**User flows**

1. **Entry** (App store/landing) → Email/phone/password → 2FA → session created.
2. **Upload bill** (PDF/JPG/Camera) → OCR → **Review screen** with POD, supplier, 12‑mo usage; user corrects if needed.
3. **Consents** (service/monitoring required, marketing optional).
4. **Eligibility check** for CER in background → eligibility banner with next action.
5. **Done** → summary and CTA to Home.

**UI**

* Welcome → Signup → Bill upload (uploader + camera) → OCR review (editable fields, highlights for low confidence) → Consents (toggles) → Eligibility result → Completion.

**Rules & validations**

* Accept OCR when confidence ≥ 0.98 on POD & usage; else force manual review.
* Onboarding “complete” only if account + ≥1 valid POD + mandatory consents.

**Errors/edges**

* Unreadable file → retry; OCR timeout → manual entry fallback.
* SME: loop to add multiple PODs.

**Events**

* Email/SMS verification; optional “first estimate ready” push.

**KPI**

* Completion rate, time to complete, first-pass OCR success.

**Acceptance**

* End‑to‑end <5 min with a valid bill; revocable consents; eligibility result surfaced.

**Standards alignment notes**

* Add an in‑app **banner & push** to resume identity or missing steps (Revolut KYC pattern).

# 02) Home / Main dashboard

**Feature ID** F02 – Home dashboard

**Goal**

* Show high‑value numbers (savings, CER, CO₂, trends) and guide next actions.

**Actors**

* New user; CER member; Prosumer; Smart‑meter user.

**Data**

* KpiSnapshot(user\_id, period, euro\_saved, co2\_kg, cer\_share\_pct, kwh\_shared, data\_state, ts)
* ActionFeedItem(id, user\_id, type, title, blurb, priority, link)

**Flows**

* Load latest snapshot; tap KPI opens detail; action feed shows 3–5 personalized CTAs.

**UI**

* Hero KPI card (money saved, CO₂; “How we calculate” link).
* CER card (share %, kWh shared; join/visit CTA).
* Production card (prosumer).
* Suggestions card (action feed).
* Secondary CTAs: Download report; Efficiency actions.

**Business logic**

* New users: primary CTA “Estimate your potential savings”.
* CER members: primary CTA “See your CER results”.
* Smart‑meter: “Today you shared X kWh at optimal hours”.

**Acceptance**

* KPI detail exists for every number; monthly report export; <2 s load with cache.

**Standards alignment notes**

* Keep **analytics shortcut** in Home top‑right; support **widgets** style analytics like Revolut.

# 03) Monitoring consumption, production & savings

**Feature ID** F03 – Monitoring

**Goal**

* Clear visualization of consumption/production/shared energy & savings by period; compare vs previous periods.

**Data**

* EnergyMeasure(id, user\_id, pod\_id, kind, granularity, kwh, source, data\_state)
* SavingBreakdown(user\_id, period, total, cer, interventions, other)

**Flows**

* Default monthly chart → switch Day/Month/Year; switch data type; toggle comparison; export CSV/PDF.

**UI**

* Tabs (Day/Month/Year), type toggle (consumption/production/shared), chart with tooltips, data-state badge, savings breakdown, Export.

**Rules**

* Label estimates vs actuals; recalc when actuals arrive; show CO₂ factor used.

**Acceptance**

* Visible data-state; exports work for all views.

**Standards alignment notes**

* **Tap-to-drill** on bars/points and **time‑of‑use clarity** match Octopus patterns.

# 04) CER enrollment & dashboard

**Feature ID** F04 – Join a Renewable Energy Community (CER)

**Goal**

* Let eligible users enroll digitally and track CER KPIs & wallet.

**Data**

* CerMembership(id, user\_id, pod\_id, cer\_id, status, joined\_at)
* CerKpi(membership\_id, period, euro\_saved, kwh\_shared, coverage\_pct, co2\_kg, data\_state)
* EnergyWalletTransaction(id, membership\_id, type, amount\_eur, ref\_period, ts)

**Flows**

* Start from Home → info → strong ID (SPID/digital signature) → summary & terms → submit → status timeline → after activation: CER dashboard (KPIs, calculation detail, wallet).

**UI**

* Info → Strong ID → Summary & consent → Status timeline → CER dashboard with “Calculation detail” and “Wallet”.

**Rules**

* Start only if eligibility = eligible; strong ID mandatory; separate CER savings from other savings.

**Acceptance**

* Paperless enrollment; monthly KPIs with estimate/actual; wallet export.

**Standards alignment notes**

* For strong ID, keep **progressive prompts (banner + push)** if user drops mid‑flow (Revolut-style prompts).

# 05) Efficiency interventions (quotes to completion)

**Feature ID** F05 – Efficiency interventions

**Goal**

* Request quotes (PV, heat pump, windows, smart meter, home automation), track status end‑to‑end, update KPIs post‑install.

**Data**

* InterventionType(id, name, category)
* InterventionRequest(id, user\_id, type\_id, status, home\_data, notes)
* InterventionOffer(id, request\_id, partner\_id, estimate, notes, status)

**Flows**

* Home wizard → recommended interventions with ROI → request quotes (min 2 partners) → track statuses, optional chat → mark completed → update KPIs.

**UI**

* Home wizard (multi‑step), Recommended interventions (cards with ROI), Quote request (pre‑filled), Requests list, Request detail.

**Rules**

* Send to ≥2 partners; only validated completions affect KPIs.

**Acceptance**

* Lead gen works; status tracking; KPI auto‑update after validation.

# 06) Gamification (missions, tokens, badges)

**Feature ID** F06 – Missions, tokens & badges

**Goal**

* Incentivize measurable behaviors; increase engagement and shared energy.

**Data**

* Mission(id, name, description, type, metric\_rule, reward\_tokens)
* UserMission(id, user\_id, mission\_id, status, period)
* TokenLedger(id, user\_id, delta, type, description, balance\_after)
* Badge/UserBadge

**Flows**

* Pick missions → system evaluates via energy data → reward tokens/badges → redeem marketplace.

**UI**

* Missions list, Mission detail (progress), Token wallet (balance & ledger), Redeem.

**Rules**

* Anti‑abuse (caps); some missions “estimated” if no smart‑meter (clearly labeled).

**Acceptance**

* ≥3 base missions; badges “First month in CER” & “100 kWh shared”; token ledger exists.

**Standards alignment notes**

* Mirrors fintech gamification norms (Revolut uses points & challenges). Use responsibly; avoid dark patterns.

# 07) Home automation (integrations & scenarios)

**Feature ID** `F07 – Home automation integration\*\*

**Goal**

* Connect external hubs/devices; enable automation scenarios that optimize consumption.

**Data**

* ConnectedPlatform(id, user\_id, provider, status)
* SmartDevice(id, platform\_id, type, room, state)
* AutomationScenario(id, user\_id, name, description, triggers, actions)

**Flows**

* Connect platform (OAuth) → list devices → pick scenarios (e.g., start washing when local production high; reduce loads at peak) → execution logs.

**UI**

* Connect platform, Device list (toggles), Scenarios (cards with on/off), Action log.

**Rules**

* MVP: ≥1 platform and ≥2 ready‑made scenarios.

**Acceptance**

* Connects to at least one platform; two scenarios; action logs.

**Standards alignment notes**

* Pair with time‑of‑use nudges inspired by energy‑app best practice (shift loads off‑peak).

# 08) Energy credits securitization (R&D, non‑MVP)

**Feature ID** F08 – Micro energy credits (R&D)

**Goal**

* Aggregate micro‑credits (e.g., certificates) and show a simplified user view of contribution and payouts.

**Data**

* EnergyCreditCandidate(id, user\_id, intervention\_id, credit\_type, prequal\_state, docs)
* EnergyCreditBatch(id, credit\_type, state, total\_value, user\_share)
* EnergyCreditPayout(id, user\_id, batch\_id, amount, pay\_state)

**Flows**

* Post‑intervention → pre‑qualify → upload docs → track: pre‑qualify → certify → sell → pay.

**UI**

* Pre‑qualification, Credit status, Batch detail.

**Acceptance**

* Internal v1 process doc; tracking prototype; internal dashboard.

# 08b) Energy provider integration (future)

**Feature ID** F08b – Partner energy provider integration

**Goal**

* Link the user’s provider account; auto‑import bills and meter readings.

**Data**

* ProviderConnection(id, user\_id, provider\_id, status, last\_sync)
* ImportedBill(id, user\_id, provider\_bill\_id, period, amount, pdf\_url)

**Flows**

* Connect provider (OAuth/login) → initial import → scheduled syncs → monitoring updates.

**UI**

* Provider list (connection status), Connection detail (last sync, “Sync now”).

**Acceptance**

* v1 integration spec; PoC with 1 partner; GDPR/legal review.

**Implementation standards (applies to all chapters)**

* **Motion:** 150–250 ms, standard/decel curves, no gratuitous animation; **honor Reduce Motion**.
* **Charts:** keyboard accessible, VoiceOver/TalkBack announce series, values, and period.
* **Loading:** skeletons for charts/cards; optimistic OCR status; retry affordances.
* **Empty states:** short explanation + primary action.
* **Errors:** place inline near field, then toast; include next steps.
* **Privacy:** consent center in Profile; explicit purposes; no pre‑ticked boxes.
* **A11y:** WCAG 2.2 AA; **target size ≥44dp**, **focus not obscured**, **drag‑free alternatives**.

# Design language quick spec (for Lovable)

**Navigation**

* Bottom tabs: Home, Monitor, CER, Actions, Profile.
* Top-right in Home: analytics/budgeting shortcut (Revolut pattern).

**Components**

* Cards (12‑pt radius), List cells, Buttons (Primary/Secondary/Tertiary), Tabs, Chips, Toggles, Steppers, File uploader (bill), Chart (bar/line), Skeletons, Toasts, Banners (resumable tasks like KYC), Empty states.

**Motion**

* Page push/pop 220 ms decel; card expand/collapse 180 ms standard; micro‑feedback 120–150 ms. **Provide non‑animated fallbacks** when OS requests reduced motion.

**Color usage**

* Primary buttons: primary‑500 fill with white text on **dark** or primary‑700 on **light**.
* Secondary accents: secondary‑500 on dark; secondary‑700 on light.
* Charts: neutral base with brand accents for highlights; never rely on color alone.

**Copy**

* Headings concise; body ≤2 lines per card; “Learn how we calculate” links from KPIs.

**Notes on parity with references**

* **Octopus Energy** emphasizes readable usage charts and tapping bars/intervals to reveal details and cost; ensure the bar/tooltip interaction is first‑class.
* **Revolut** centralizes analytics via Home and top‑right shortcuts; your Home should mirror that quick access and keep drill‑down shallow.
* **Reduce Motion** and **durations/easings** must follow Material & Apple guidance to avoid discomfort and meet accessibility expectations.