

# Nordic Climate Finance Hub

## Investor Platform — Technical Documentation

Version 1.0 · Internal

[hub.ncfsummit.org/investor](https://hub.ncfsummit.org/investor)

# Nordic Climate Finance Hub — Investor Platform

Documentation for the Nordic Climate Finance Hub (NCF Hub) Investor Platform — the system of record for sourcing, screening, and conducting investor-grade due diligence on climate financing opportunities across the Nordics and partner regions. The platform connects institutional investors, family offices, development finance institutions, and corporate treasuries with vetted climate projects and ventures seeking capital, centralising deal origination, due diligence, document rooms, and portfolio tracking in one auditable workspace.

## What the platform does

- **Curated deal flow** — a screened pipeline of climate financing opportunities (debt, equity, blended, grants).
- **Investor-grade due diligence** — standardised scorecards, document rooms, expert reviews, and IC-ready memos.
- **Project profiles** — financials, team, technology, climate thesis, risk register, and references.
- **Investor workspace** — watchlists, mandates, co-investor signals, and pipeline analytics.
- **Ecosystem Capital Summits** — programmatic ties to NCF Summit sessions, matchmaking, and partner events.

## Platform modules

- 1 **Investor Directory** — Searchable database of climate-finance investors with deal history, ticket size and thesis filters. Profiles cover mandates, sector focus, geographic reach, instrument preferences, recent activity and co-investment patterns.
- 2 **Deal & Co-Fund Campaigns** — Live transaction pipeline to syndicate, co-invest and back climate ventures alongside curated LPs. Each campaign exposes the lead investor, capital-stack slot, ticket range, terms, timeline and required diligence artefacts, with commitment tracking and document rooms.
- 3 **Matchup Engine** — AI-matched introductions between Companies, Professionals, Investors and Projects. Scored on mandate fit, stage, sector, geography and instrument; double opt-in before any intro, and every consent and intro is logged.
- 4 **Climate Finance Leaderboard** — Public ranking of the most active funds, banks and corporates deploying capital to net-zero. League tables refreshed daily and linked back to the underlying verified transactions and a transparent methodology page.
- 5 **Masterclass Library** — On-demand sessions from summit speakers and structured climate finance education year-round. Video lessons, downloadable resources, knowledge checks and completion certificates that persist per user.
- 6 **Satellite Events** — Distributed programme between summits with meetups, roundtables and country chapters. Hosts publish agendas, manage RSVPs and ticket tiers, coordinate sponsors, and roll outcomes back into the main NCF Summit programme.

- 7 **News & Intelligence** — Curated Nordic climate-finance newsroom delivering daily signal, weekly briefings and market intel. Tagged by company, sector, instrument and geography; cross-linked with Deal Pipeline, Leaderboard and Intelligence Base.
- 8 **Delegate Concierge** — Pre-summit scheduling, firechat bookings and partner introductions in one workspace. Recommended meetings based on mandate or company profile; manage 1:1s, group sessions and sponsor introductions from a shared calendar with on-site check-in.

# System Architecture

End-to-end topology of the NCF Hub Investor Platform — the web app, mobile app, and cloud backend that power deal flow, due diligence, matchmaking, and intelligence for the Nordic climate-finance community.

## Logical view

The platform is modular and served to two first-party clients (web and mobile) and a curated set of partner integrations. All clients talk to the same domain services through a single secured API gateway. The platform is multi-tenant, audit-first, and designed to meet investor-grade due diligence and compliance requirements.

## End-to-end topology (Mobile · Web · Cloud)



## Web App (hub.ncfsummit.org/investor)

The investor workspace. Optimised for dense data and multi-step due-diligence flows.

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Web App (Browser)
UI Layer
- TanStack Start (SSR) · React 19 · TypeScript
- Tailwind v4 design system · shadcn/ui
- TanStack Router · TanStack Query
Feature surfaces
- Investor Directory · Deal & Co-Fund Campaigns
- Matchup Engine · Leaderboard · Masterclass Library
- Satellite Events · News & Intelligence · Concierge
- Document rooms · IC memos · Watchlists · Pipeline
Cross-cutting
- OIDC session (Supabase) · SSO · MFA
- Command palette · keyboard-first
- Telemetry · error capture · feature flags

```

## Mobile App (iOS · Android)

Companion app for delegates and investors on the move — concierge scheduling, deal review, matchmaking, and on-site summit operations. Offline-first for low-connectivity venues.

```

Mobile App (iOS / Android)
Shell
- React Native · Expo SDK · TypeScript
- Expo Router · TanStack Query (persisted)

```

- SQLite (SQLCipher) · Secure Enclave / Keystore
- Delegate & investor features
- Concierge: 1:1s, firechats, partner intros, calendar
  - Matchup inbox · accept / decline · QR check-in
  - Deal pipeline read + light actions (watch, NDA, signal)
  - Masterclass playback · offline lessons · certificates
  - News feed · push alerts · saved briefings
- Platform services
- Biometric unlock · auto-lock · remote wipe
  - Offline outbox · idempotent sync · conflict resolution
  - Push (APNs / FCM) · deep links to web app
  - OTA updates via EAS Update

## Cloud App (Backend Platform)

The system of record. Domain services are deployed independently behind a single gateway, share platform services, and persist to Postgres with row-level security plus an append-only audit log.

- Cloud Platform
- Edge / Gateway
- TanStack Start on Cloudflare Workers (SSR + server fns)
  - AuthN: Supabase OIDC · SSO (SAML/OIDC) · MFA
  - AuthZ: RBAC (Admin · Investor · Analyst · Sponsor · Viewer)
  - Tenant scoping · rate limits · WAF · bot mgmt
  - Request signing for partner APIs · webhook HMAC
- Domain services
- Investor Directory - profiles, mandates, deal history
  - Deal & Co-Fund Campaigns - pipeline, syndicates, data rooms
  - Matchup Engine - AI scoring, double opt-in intros
  - Leaderboard - daily rankings, methodology
  - Masterclass & Library - video, knowledge checks, certs
  - Satellite Events - agendas, RSVPs, ticketing, hosts
  - News & Intelligence - newsroom, briefings, tagging
  - Concierge & Summits - scheduling, firechats, check-in
- Shared platform services
- Identity & org graph · Notifications
  - Search (OpenSearch) · Files & data rooms (S3, watermark)
  - Audit log (append-only, hash-chained) · Feature flags
  - Billing & entitlements · Analytics & reporting
  - Claude AI and Codex (matching, enrichment, summarisation)
- Data plane
- Postgres 16 - RLS, logical replication to analytics
  - Object storage (S3) - documents, KYC, exports
  - OpenSearch - full-text, faceted, geo
  - Queue/Workers - SQS + Redis, scheduled jobs, ETL
  - Data warehouse - anonymised snapshots for BI
- Integrations
- KYC/AML providers · sanctions screening
  - DocuSign / e-signature · payment rails (Stripe)
  - Calendar (Google/Microsoft) · video (Zoom/Meet)
  - CRM (HubSpot/Salesforce) · ESG & climate data feeds
  - Summit ticketing & badge printing

## Runtime

- **Edge / SSR:** TanStack Start on Cloudflare Workers.
- **Domain services:** Node.js (TypeScript) workers deployed as isolated functions or containers.
- **Database:** Postgres 16 (Supabase) with row-level security and logical replication.
- **Object storage:** S3-compatible bucket for documents, data rooms, exports.
- **Search:** OpenSearch for full-text, faceted, and geo queries.
- **Background jobs:** Queue-backed workers for matching, leaderboard refresh, notifications, ETL.
- **AI:** Claude AI and Codex for matching, enrichment, summarisation, and intelligence briefings.
- **Mobile:** React Native via Expo, distributed through TestFlight and Google Play with EAS Update.

## Cross-cutting concerns

- **AuthN:** OIDC via Supabase with SSO (SAML / OIDC) and MFA for enterprise tenants.
- **AuthZ:** RBAC (Admin, Investor, Analyst, Sponsor, Project Owner, Viewer) with tenant scoping and Postgres RLS.
- **Audit:** Append-only, hash-chained event log; exported nightly to cold storage.
- **Privacy:** Double opt-in for introductions; consent logged; GDPR data-subject workflows.
- **Observability:** Structured logs, OpenTelemetry traces, RED metrics dashboards, SLO alerting.
- **Compliance:** SOC 2 Type II controls, GDPR, KYC/AML for investor onboarding, ESG disclosure alignment.

# Backend, Security & Data Access

Server-side architecture, security posture, and data-access model. Optimised for investor-grade due diligence: confidentiality, auditability, and least-privilege access to sensitive deal information.

## Design principles

- **Confidentiality by default** — every record is private until an explicit grant says otherwise.
- **Least privilege** — every actor gets the minimum scope they need.
- **Defence in depth** — controls layered across network, application, database, and key-management.
- **Audit everything** — every access, decision, and export is recorded in an immutable log.
- **EU data residency** — primary storage in the EU; cross-border replication is opt-in per tenant.

## Stack

- **Runtime:** TanStack Start server functions on an edge worker runtime; TypeScript strict.
- **Database:** Managed Postgres with row-level security (RLS) enforced on every table.
- **Auth:** OIDC / SAML SSO; short-lived JWT bearer tokens; SCIM provisioning.
- **Object storage:** Encrypted bucket with signed, expiring URLs.
- **Secrets:** Managed secret store; no secrets in code, env files, or client bundles.
- **Validation:** Zod at every trust boundary (request, server-fn input, webhook, env).

## Data access model

Access is evaluated in three layers. A request must satisfy all three to read or write a record.

Layer	Enforces	Mechanism
Tenant	Investor firm isolation	tenant_id on every row; RLS predicate matches caller's tenant.
Entitlement	Which opportunities / data rooms tenant can see	entitlements table with explicit grants per opportunity, instrument, etc.
Role	What caller can do once they can see	Role check via has_role(auth.uid(), ...); mutating operations gated

## Encryption & key management

- **In transit:** TLS 1.3 only; HSTS preloaded; certificate pinning on mobile.
- **At rest:** AES-256 on database and object storage; envelope encryption for KYC, beneficial ownership, banking.
- **Key management:** managed KMS with per-tenant data keys; automatic rotation; access logged.
- **Backups:** encrypted, geo-redundant within the EU; quarterly restore drills.

## Audit & immutability

- Append-only audit\_log table covering auth, access, mutation, decision, and export events.
- Hash-chained entries; daily Merkle-root anchored for tamper evidence.

- IC decisions, NDA acceptances, and DD sign-offs are hash-stamped and immutable.
- Closed reporting periods cannot be edited; restatements use append-only deltas.

## API conventions

- **Internal calls:** typed server functions via `createServerFn`, gated by auth middleware.
- **External calls:** REST + JSON; resource-oriented URLs; cursor pagination; RFC 7807 errors.
- **Versioning:** URI versioning (`/v1/...`); breaking changes ship a new major.
- **Idempotency:** Idempotency-Key required on state-changing POSTs.

# Frontend

Shared frontend foundations used by every surface: component system, design tokens, state management, and routing conventions.

## Stack

- **Framework:** React 19 + TanStack Start (SSR on the edge).
- **Routing:** TanStack Router with file-based routes.
- **Data:** TanStack Query + server functions; loaders prefetch, components useSuspenseQuery.
- **Styling:** Tailwind CSS v4 with semantic tokens.
- **Components:** shadcn/ui primitives.
- **Forms:** React Hook Form + Zod resolvers.
- **Charts:** Recharts for KPIs; deck.gl for geospatial overlays.
- **Testing:** Vitest (unit), Playwright (e2e), Storybook (visual).

## Performance budget

Metric	Target
LCP (p75)	< 2.0 s
INP (p75)	< 200 ms
JS per route	< 180 KB gzipped
API p95 latency	< 400 ms

## Accessibility

Every component meets WCAG 2.2 AA, enforced with axe-core in CI plus manual screen-reader passes on critical flows.

# Investor Platform (Web App)

The primary workspace where fund managers, analysts, and verifiers run their day. Optimised for dense data, multi-step workflows, and side-by-side review.

## Top-level navigation

- **Pipeline** — deal flow board, scorecards, due-diligence rooms.
- **Portfolio** — active facilities, disbursement schedule, covenants.
- **Reporting** — investor letters, registry exports, impact dashboards.
- **Admin** — tenants, users, roles, audit log.

## Key workflows

### *Originate a deal*

- 1 Analyst creates a deal from template.
- 2 System auto-fills geography, methodology, and baseline scorecard suggestions.
- 3 Documents are uploaded to a tenant-scoped data room with watermarking.
- 4 Investment Committee votes inline; decision is hash-stamped to the audit log.

### *Deploy capital*

- 1 Term sheet generated from approved deal; counter-signed via DocuSign.
- 2 Disbursement schedule auto-created from milestones.
- 3 Each disbursement requires dual approval and a verified bank account.
- 4 Repayments reconciled nightly against bank feed.

## Browser support

Last 2 versions of Chrome, Edge, Safari, and Firefox on desktop. Tablet supported with adaptive layouts; phones redirect to the mobile app.

# Mobile App

Field-ready companion app for measurement capture, on-the-go approvals, and offline operations in low-connectivity environments.

## Stack

- **Framework:** React Native via Expo SDK 52, TypeScript.
- **Navigation:** Expo Router (file-based).
- **State:** TanStack Query with persistence; SQLite (op-sqlite) for offline cache.
- **Maps:** Mapbox GL Native with offline tile packs.
- **Sensors:** Camera, GPS, accelerometer, NFC for tag scanning.
- **Distribution:** TestFlight + Google Play closed track; OTA via EAS Update.

## Offline-first model

- 1 User performs action → optimistic UI, write to local SQLite.
- 2 Outbox worker batches writes and uploads when online.
- 3 Server applies writes idempotently; returns canonical ids and timestamps.
- 4 Local store reconciled; UI re-renders silently.
- 5 Failures surface in a 'Sync issues' tray with retry / discard actions.

## Security

- Biometric unlock (Face ID / fingerprint) required.
- Local DB encrypted with SQLCipher; keys in Secure Enclave / Keystore.
- Auto-lock after 5 minutes; remote wipe via admin console.
- Screenshots disabled on sensitive screens.

**Supported devices:** iOS 16+ and Android 11+.

# Product Specifications

Module-by-module specifications for the NCF Hub Investor Platform. Scope is investor-grade due diligence and climate financing — not MRV or carbon credits.

## Information architecture

- **Dealflow** — Dashboard, News, Companies, Sectors, Locations.
- **Matchup Tool** — Companies, Professionals, Investors, Projects.
- **Transactions** — historical and live climate-finance transactions.
- **Climate Finance Leaderboard** — ranked activity.
- **Event Platform** — NCF Summit and partner programming.
- **Masterclass · Stats & Insights · Intelligence Base** — learning and research.
- **Contact · FAQ** — support surfaces.

## Core entities

Entity	Owns	Lifecycle
Company	profile, sector, location, team, raise status	submitted → verified → listed → archived
Project	profile, instrument, capital stack, milestones	submitted → verified → fundraising → closed
Investor	mandates, watchlist, members, activity	invited → active → archived
Professional	profile, expertise, affiliations	invited → active → archived
Match	parties, fit score, status, notes	suggested → mutual → introduced → declined
Transaction	parties, instrument, amount, date, sources	draft → verified → published
Event	agenda, sessions, attendees, sponsors	planned → open → live → closed
Lesson	module, video, resources, completions	draft → published → retired

## Cross-cutting: investor-grade due diligence

- Every Company, Project, and Transaction profile is evidence-first: claims link to sources.
- Standardised DD workstream: commercial, technical, financial, legal & regulatory, ESG & climate, team & governance, risk.
- Data rooms with granular permissions, watermarking, expiring links, NDA gating, full analytics.
- KYC / AML status, sanctions screening, beneficial-ownership records per entity.
- Auto-assembled IC memo from scorecards, evidence, and recommendation.

## Non-functional requirements

- 99.9 % monthly uptime for the investor workspace.
- RPO 5 min, RTO 1 h for the primary database.
- Data residency in the EU by default; per-tenant region pinning available.

- Launch locales: en, sv, no, da, fi; expansion: de, fr.
- Every screen meets WCAG 2.2 AA.

# Standard Procedures

Standard operating procedures that make outcomes reproducible, auditable, and safe.

## SOP-001 — Development workflow

- 1 Pick a ticket from the current sprint; move it to In progress.
- 2 Create a branch feat/<ticket-id>-short-slug.
- 3 Write tests first when modifying domain logic.
- 4 Open a draft PR early; CI must pass.
- 5 Request review from a domain owner; one approval required.
- 6 Squash-merge with a Conventional Commit message.

## SOP-002 — Release

- 1 Releases ship every weekday at 14:00 UTC; hotfixes any time.
- 2 Release captain rotates weekly; owns notes and rollback decision.
- 3 Tag vYYYY.MM.DD.N; staging soaks 30 min before promotion.
- 4 Production deploy gated by a green synthetic monitor run.
- 5 Post-release: monitor RED dashboard for 30 min; close changelog.

## SOP-003 — Incident response

- 1 Anyone can declare an incident in #incidents with severity.
- 2 Incident commander assigned within 5 min for SEV-1 / SEV-2.
- 3 Comms lead posts updates every 30 min on the status page.
- 4 Mitigate first, fix later; rollback is always acceptable.
- 5 Blameless postmortem within 5 business days.

## SOP-006 — Access management

- 1 Access granted by role, not individual permissions.
- 2 New hires onboarded via access-request workflow; manager approves.
- 3 Quarterly access review by tenant admin; revocations within 24 h.
- 4 Offboarding triggers immediate session invalidation and device wipe.

## SOP-007 — Backups & disaster recovery

- 1 Continuous WAL shipping to a separate region.
- 2 Nightly snapshots retained 35 days; monthly for 12 months.
- 3 Quarterly restore drill against an isolated environment.

# User Experience

Principles and patterns that shape every surface. Designed for professionals who do consequential work — fast, safely, and with a clear audit trail.

## Principles

- 1 **Truthful by default.** Numbers always show source, vintage, and last-updated.
- 2 **Reversible when possible, deliberate when not.** Destructive actions require confirmation naming the object and consequence.
- 3 **Field-aware.** Mobile flows assume bad networks, gloves, glare, one-handed use.
- 4 **Quiet UI, loud signals.** Color reserved for status, deltas, warnings.
- 5 **Keyboard parity.** Anything possible with mouse is possible with keyboard.

## Interaction patterns

- **Command palette (■K):** jump to any object, run any action, search across tenants.
- **Inline edit:** click to edit; Esc to cancel; Enter to save; optimistic with rollback.
- **Drawer over modal:** drawers preserve context; modals reserved for hard blocks.
- **Split view:** list + detail with synchronised filters.
- **Multi-step approvals:** a single review screen shows all evidence side-by-side.

## Accessibility

- Color contrast 4.5:1 minimum (3:1 for large text); tested in light and dark themes.
- All interactive elements reachable via tab with visible focus rings.
- Form labels associated programmatically; errors announced to assistive tech.
- Reduced-motion preference honoured for transitions and chart animations.