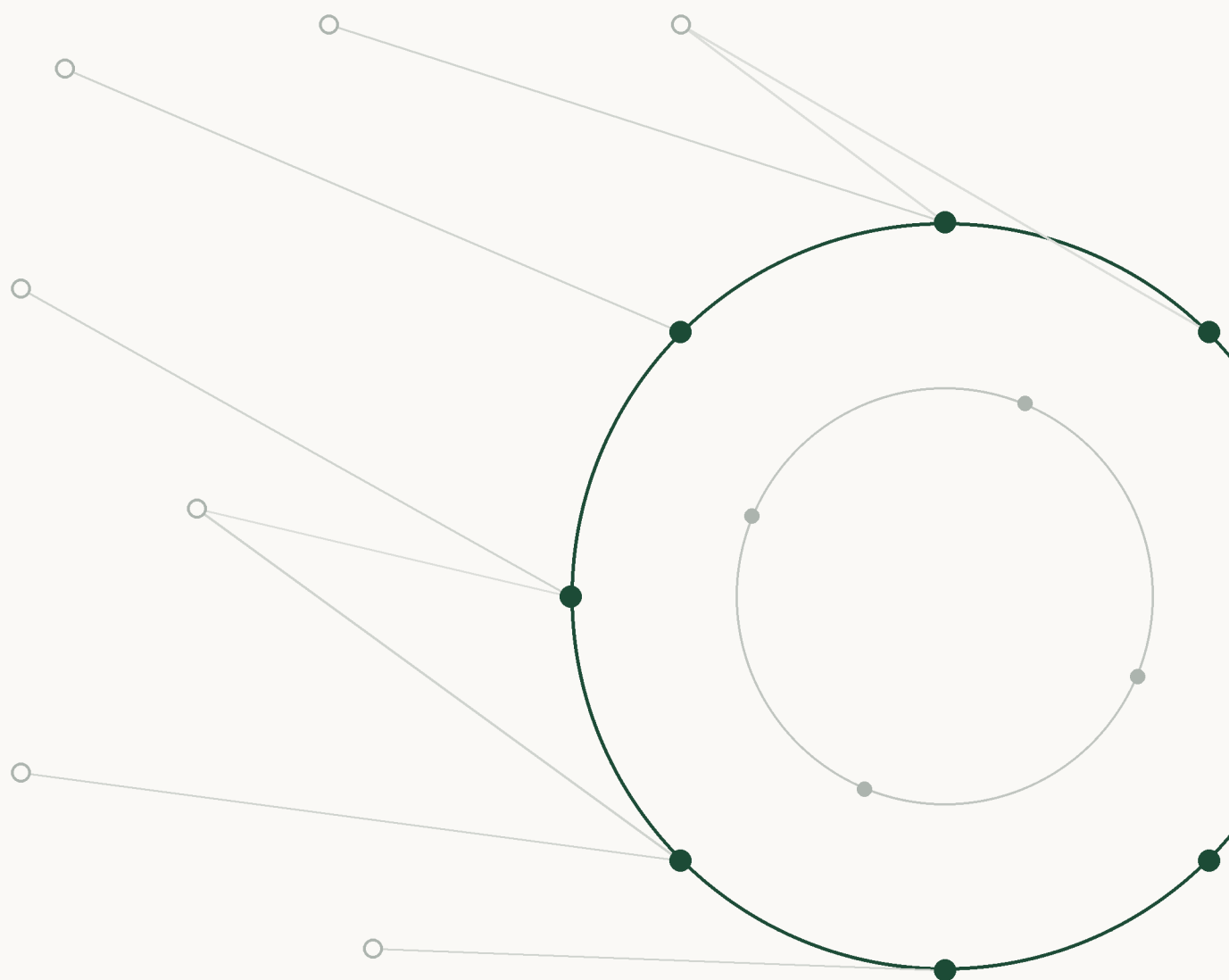


PraxisPass

An Employer-Trusted Competence Record
System for Germany's Green Transition



Abstract

Germany's green transition is constrained by a labour shortage it should not have. As the country pursues climate neutrality, the German Competence Centre for Securing Skilled Labour (KOFA, 2025) records a 50.6 percent vacancy-overhang rate in raw-material extraction, production, and manufacturing, for half of roughly 163,000 unfilled vacancies in the field, no suitably qualified unemployed person exists. Battery recycling, an occupation category with no state licensing requirement, sits inside a market where PwC projects a tenfold increase in the volume of recyclable battery material across Europe between 2030 and 2040. At the same time, Germany hosts more than 1.1 million Ukrainians under temporary protection, alongside sizeable populations from Romania, Turkey, and Syria, of whom 60 percent of the employed remain in survival jobs below their qualification level. This paper argues that the two problems share a single cause: a credential-recognition system, anchored in the Recognition Act of 2012, that verifies paper rather than performance, and so excludes precisely the workers who could staff the green transition. We propose PraxisPass, an employer-trusted competence-record platform that lets supervisors and peers validate a migrant's skills directly on the factory floor, in the non-regulated green occupations where state licensing is not required, unlocking an earn-while-learning pathway into the labour market. Where Germany's recognition system demands a *Nachweis*, a paper proof, PraxisPass supplies one earned in practice rather than on paper. By replacing paper trust with performance trust, PraxisPass offers a rapid, low-cost route to labour-market integration for displaced workers and a compliance-ready hiring channel for an industry under legal pressure to scale.

About the team

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Chapter 1: Introduction

The following scene is a composite, drawn from the documented conditions this paper reviews below, not a reported case. On an industrial estate outside Duisburg, a battery-recycling line runs at half capacity. The shredders and sorting belts that recover lithium, cobalt, and nickel from spent electric-vehicle batteries sit idle for want of hands, not investment: the plant operator has capital, machinery, and a legal mandate under EU battery regulation to recover the metals inside, but not enough workers to run the line at full throughput. A few kilometres away, in the same city, a Ukrainian mechanical engineer delivers food by bicycle. He fled Kharkiv with his family and a phone full of photographs of his diplomas, not the apostilled originals a German employer would require to verify them. He would take the recycling job tomorrow, if someone would trust that he could do it.

This scene is not an anomaly; it is the shape of two of the defining forces in the future of work colliding without connecting. The first is the green industrial transition: as economies attempt to decouple growth from emissions, they are creating a wave of new manual and technical labour demand in sectors such as battery recycling, circular-economy sorting, and renewable-energy maintenance. The second is forced displacement, driven today by conflict and, over coming decades, increasingly by climate change: a growing population who arrive with real skills and no recognised way to prove them to a system built around paper. Germany sits at the centre of both at once: Europe's largest industrial economy, a self-declared climate leader, and one of the EU's largest hosts of displaced Ukrainians. What happens in its labour market previews the rest of Europe's battery belt, from Poland to France.

This paper argues that Germany's green-labour deficit and its underemployed migrant workforce are not two separate problems but a single, solvable mismatch, and that the mechanism blocking the match is not a shortage of jobs or of workers but a credential-recognition system that measures documents instead of demonstrated competence. Our research question is therefore: how can labour-market institutions verify and mobilise the skills of displaced workers fast enough to meet the pace of the green transition, without relying on the slow, document-dependent recognition procedures that structurally exclude them? This paper is based on desk research, document analysis of official German federal, EU, and UN sources, and draws on no primary interviews or fieldwork.

The paper proceeds as follows. Chapter 2 establishes the problem architecture: the scale of the green-labour deficit in non-regulated occupations, the paradox of an underemployed migrant workforce, and the credential-recognition trap that connects the two. Chapter 3 reviews existing recognition frameworks and identifies the three-part gap they leave open. Chapter 4 presents our solution, PraxisPass, and its underlying trust mechanism. Chapter 5 maps PraxisPass back onto the problem architecture of Chapter 2 and assesses its impact across stakeholders. Chapter 6 addresses feasibility and financing, including legal foundation and scalability. Chapter 7 sets out a phased implementation roadmap and risk register, anchored in a pilot in the Ruhr's battery-recycling sector. Chapter 8 concludes by situating PraxisPass within a broader shift from paper trust to performance trust as a transferable model for labour-market integration across Europe's green transition.

Chapter 2: The Problem Architecture

2.1 Green Labour Deficit

A central paradox of contemporary economic development is that sustained growth has historically been coupled with rising resource consumption and greenhouse-gas emissions, challenging the long-term sustainability of growth-oriented economic models (International Labour Organization [ILO], 2018). Germany has committed to breaking that coupling: alongside its energy transition and climate-neutrality targets, the country has recorded average annual GDP growth of 1.3 percent alongside average annual reductions in greenhouse-gas emissions and carbon footprint of 0.9 and 0.7 percent respectively (ILO, 2018), evidence that decoupling is achievable rather than theoretical (Clean Energy Wire, 2024).

Decoupling of this kind depends on the expansion of green jobs: employment in renewable energy, energy efficiency, and sustainable infrastructure that substitutes for carbon-intensive activity while supporting a low-carbon economy (ILO, 2018). Germany's environmental goods and services sector has grown accordingly (OECD, 2012), and the rapid deployment of renewable-energy technology (Clean Energy Wire, 2024) has generated a wave of new demand for technical and manual labour.

That demand, however, is going unmet. The German Competence Centre for Securing Skilled Labour recorded the largest skills gap of 2024 in raw-material extraction, production, and manufacturing: roughly 163,000 vacancies for which no unemployed person with a matching qualification existed, a vacancy-overhang rate (Stellenüberhangsquote) of 50.6 percent, for half of all vacancies in this field, no suitably qualified unemployed person exists in Germany at all (KOFA, 2025). The hardest-to-fill occupations KOFA names are mechatronics (a gap of 11,065, an 87.7 percent overhang), building electrics (18,343; 79.8 percent) and electrical-engineering experts (8,519; 83.1 percent), all central to the energy transition (KOFA, 2025).

This headline figure requires one honest qualification before it can support this paper's argument. The three occupations KOFA names are licensed, state-regulated trades, and Fachkräftelücke, by construction, counts vacancies that require a formal qualification. The 163,000 figure is therefore an upper bound on the problem this paper addresses, not a direct measure of it: it includes roles our proposal does not, and cannot, resolve. Those licensed roles cannot be filled quickly by anyone, migrant or native, because the licence itself takes years to obtain, no verification mechanism, however trusted, substitutes for a multi-year training. But the same plants short of licensed mechatronics technicians and electricians are simultaneously short of non-regulated helper and technical staff, physical battery dismantling, circular-economy sorting, and solar-PV handling and installation support, roles that carry no statutory certification requirement and that an employer is legally free to staff on the basis of demonstrated competence alone. Staffing these non-regulated roles now does two things at once: it fills vacancies directly, and it releases the scarce licensed personnel already on site from helper-level tasks so they can do the licensed work only they are permitted to do. Read this way, the 163,000 vacancies and the 50.6 percent overhang are evidence of a structural mismatch across the sector as a whole, of which the non-regulated segment this paper targets is a real but smaller part.

Battery recycling illustrates the scale of the opportunity. PwC projects a tenfold increase in the volume of recyclable battery material in Europe between 2030 and 2040, driven initially by gigafactory production scrap and then by the first electrification wave reaching end-of-life. EU regulation compounds this, requiring recyclers to recover a rising share of the lithium in every battery. Yet this is precisely the kind of labour-intensive, non-regulated work that is hardest to staff through Germany's conventional channels, which are oriented toward attracting formally certified specialists rather than

absorbing workers who can be trained on the line in hours rather than years. The result is a structural inefficiency: a green sector expanding on schedule, backed by capital and regulation, but constrained on the shop floor by a labour-market architecture that was not designed for low-barrier, high-growth, non-regulated work. Closing this gap requires not more workers in the abstract, but a mechanism that can route the workers who already exist into the specific, non-regulated roles the transition needs filled fastest.

2.2 Migrant Presence Paradox

Germany's green-labour deficit exists beside a demographic paradox: a large, available, and growing pool of migrant labour that the deficit is not absorbing. Ukrainians under temporary protection are the largest single group, numbering more than 1.1 million nationally, alongside sizeable populations from Romania, Turkey, and Syria who arrived through other migration channels (DESTATIS, 2025; BAMF, 2024). Instruments exist, in principle, to route this population toward exactly the bottleneck industries described in Section 2.1: the Skilled Immigration Act's EU Blue Card channels non-EU workers with a university degree and a job offer, and its Opportunity Card is explicitly designed to fill bottleneck-industry vacancies without requiring a prior job offer at all, so long as the applicant holds relevant training and language knowledge.

Despite this policy architecture, the volume of available labour is not converting into labour-market integration at anything like the rate the deficit in Section 2.1 would predict. This is the trap: 60 percent of employed Ukrainian refugees in Germany are working below their skill level, trapped in what the literature terms "survival jobs", positions accepted for immediate income rather than skill alignment (ILO, 2024). Occupational downgrading of this kind is not evidence of low skill; it is evidence of a labour market unable to see the skill that is present. Migrants constitute an underutilised labour force despite facing persistent, well-documented barriers, including higher unemployment rates, skills mismatch, and difficulty obtaining recognition for foreign qualifications (ILO, 2019; ILO, 2024).

The paradox, then, is not that Germany lacks migrant labour or lacks green-sector demand; both exist in scale sufficient to solve each other on paper. It is that the mechanism connecting supply to demand is broken in a specific and identifiable way. A Ukrainian mechanical engineer and a battery-recycling plant short of dismantling staff are, in principle, a match. In practice, the Opportunity Card and Blue Card require exactly the documentation that displaced workers are least likely to possess intact, and the informal, undocumented competence that a refugee actually carries has no recognised channel into the formal labour market at all. Improving migrants' access to green employment would simultaneously support Germany's climate objectives, its industrial competitiveness, and inclusive economic growth (ILO, 2018); what is missing is not the population or the demand, but the mechanism that would let one meet the other. Section 2.3 explains why.

2.3 Credential-Recognition Trap

Sections 2.1 and 2.2 establish two facts that should cancel each other out: Germany has a sector-wide vacancy-overhang of 50.6 percent in raw-material extraction, production, and manufacturing, of which the non-regulated green and manual occupations this paper targets are a real, if smaller, part, and it hosts well over a million migrants, a majority of whom are working below their qualification level. This section explains why they do not cancel out, and argues that the reason is structural rather than incidental.

Germany's formal recognition system, governed by the Recognition Act of 2012 (Berufsqualifikationsfeststellungsgesetz, BQFG), was designed to verify equivalence between a foreign qualification and a German one. It does this reasonably well for the population it was built for: workers who left their country of origin with time to plan, carrying complete, apostilled documentation. It performs badly, almost by design, for displaced people, who typically do not have that time. A refugee fleeing conflict rarely departs with a certified copy of every diploma and employment reference a nostrification procedure demands, and the institutions that issued those documents may themselves be inaccessible or unresponsive during the very period the recognition process needs them most. The mismatch between what the system asks for and what a refugee can produce is not a paperwork inconvenience; it is a structural exclusion built into the design of the recognition procedure itself.

The scale of that exclusion is visible in the outcomes. Published figures on recognition applications for Ukrainian qualifications vary across sources; this paper reports the more conservative estimate, from Mediendienst Integration: roughly 3,500 applications for recognition of Ukrainian professional qualifications, of which about 29 percent were fully recognised. For a population of over a million people, a mechanism that few complete, and that fully recognises a minority of those who do, is not a bottleneck; it is a closed door for most of the population it nominally serves.

The deeper problem is what the system chooses to measure. Formal recognition evaluates the document, not the worker: it asks whether a piece of paper matches a German equivalent, rather than whether the person holding it can competently sort battery cells, operate dismantling equipment, or read a safety protocol. This is a defensible standard for regulated professions, such as medicine or law, where the state has a public-safety interest in verifying formal training before someone practises. It is an arbitrary and costly standard for the non-regulated green occupations identified in Section 2.1, where no statutory licence is required for employment and where an employer is already legally free to hire on the basis of observed competence alone.

It would be a mistake, however, to claim that Germany lacks any mechanism for verifying competence without paper. It does not. Chamber-run validation under ValiKom and ValiKom Transfer, the statutory validation procedure the BVaDiG wrote into the BBiG with effect from 1 January 2025, and admission to the Externenprüfung under §45(2) BBiG on the basis of documented work experience, all already exist and are reviewed in full in Chapter 3. The gap is not their absence. It is that all three are one-off, appointment-based, assessor-led procedures that validate competence a worker can already document, and a displaced worker who fled without a personnel file has nothing yet to submit to them. They evaluate evidence; they do not generate it.

This is the analytical hinge of the paper, stated precisely: Germany's green-labour deficit and its underemployed migrant workforce are locked apart not by a shortage of jobs, workers, legal pathways, or even validation instruments, but by the absence of a mechanism that generates the dated, supervisor-attested evidentiary record that Germany's own validation instruments require as their input, and that a displaced worker without documentable history cannot yet supply. Closing that gap does not mean competing with Germany's recognition architecture; it means feeding it. Chapter 3 examines the existing landscape, including the three instruments above, in full; Chapter 4 develops PraxisPass as the mechanism that supplies their missing input.

Chapter 3: Landscape and Critique

3.1 Formal Frameworks

Europe's skills-recognition landscape rests on a handful of formal frameworks built to standardise qualifications across borders. The European Qualifications Framework (EQF) and the European Skills, Competences, Qualifications and Occupations (ESCO) classification supply a common language for mapping skills to occupations, and the EU Skills Profile Tool maps the existing capabilities of third-country nationals. In Germany, the Recognition Act (2012) is the principal statutory mechanism, and the Anerkennung in Deutschland portal directs migrants to the relevant recognition bodies.

These frameworks share one shortcoming: they depend on formal physical documentation and a bureaucratic process that runs for months. That dependency excludes refugees who fled without their original diplomas, or whose home-country institutions can no longer verify anything. The scale of that exclusion is set out in Section 2.3: a small fraction of the eligible population applies, and only a minority of applicants are fully recognised. Skilled workers wait in low-skilled, informal, or survival jobs while the state validates a document, not a person.

3.2 Micro-credentials & Recognition of Prior Learning

Two state-led responses try to work around the diploma requirement. MYSKILLS, built by the German public employment service, is a computer-based tool that shows candidates videos of standard job tasks and asks them to spot errors or sequence steps correctly — an assessment of informal skill that needs no paper credential. Jobturbo, launched in 2023, pairs refugees with intensified job-search counselling to accelerate placement.

Both have real limits. Jobturbo nearly doubled the exit-to-job rate for Ukrainian refugees, but the gains went mostly to men, in low-skilled jobs. MYSKILLS is a one-time assessment taken before employment; it has no mechanism for validating skill on the job, and no path for a migrant to build and prove higher-level competence once they are actually working.

3.3 Statutory Validation Instruments

The review above stops short. Germany has already built three mechanisms, statutory or nearly so, for validating competence learned outside formal training, and any honest account of the landscape has to engage with them.

§45(2) of the Vocational Training Act (BBiG) admits a candidate with no apprenticeship contract and no diploma directly to the final vocational examination (Externenprüfung), on the basis of documented work experience of roughly 1.5 times the normal training duration. Around 18,500 people were admitted on this basis in 2022 (BIBB, 2024). ValiKom and its successor, ValiKom Transfer, run jointly by the Federal Ministry of Education and Research (BMBF), the chambers of industry and commerce (DIHK), and the chambers of crafts (ZDH), let a chamber assess informally acquired competence against a reference occupation and issue a certificate of full or partial equivalence; between November 2018 and April 2023, 2,012 people took part nationally, 43 percent of them non-German citizens and 54 percent born abroad (Wirtherle, 2024). Most recently, the BVaDiG, passed on 19 July 2024, wrote a statutory validation procedure into the BBiG itself, effective 1 January 2025, moving chamber validation from a funded pilot to permanent law (BVaDiG), 2024)

These instruments matter for one reason: they show Germany already has a legal channel from demonstrated competence to a recognised credential, separate from the diploma-equivalence system critiqued above. What they do not do is the subject of Section 3.4.

3.4 The Real Gap

Formal frameworks and statutory validation instruments both exist, and a three-part gap still sits between what they can do and what a newly arrived, displaced worker needs.

1. Throughput. ValiKom Transfer processed 2,012 people nationally over four and a half years, under 500 a year, against a population of over a million Ukrainian temporary-protection holders alone. A legally sound instrument this small cannot close a gap this size. 2. Sequencing. §45(2) BBiG, ValiKom, and the BVaDiG's procedure all validate competence a candidate can already document. None generates the dated, supervisor-attested record of tasks performed that a worker without a personnel file needs before any of them can be attempted. They sit at the end of a pathway, not its start. 3. Access. Each is a one-off, appointment-based, assessor-led procedure conducted in German, a format that filters out the newly arrived, still-language-learning population it exists to serve, and pays no wage while a worker waits to qualify.

The gap traps migrants in occupational downgrading, 60% of employed Ukrainian refugees work below their skill level, while German industry goes short-staffed. PraxisPass does not compete with §45(2) BBiG, ValiKom, or the BVaDiG's procedure. It feeds them: it generates the evidentiary record they require, while the worker earns a wage instead of waiting to produce it.

Table 1. The recognition and validation landscape compared

Instrument	What it validates	What it requires from the worker	Throughput	Terminus
BQFG formal recognition (2012)	Equivalence of a foreign qualification to a German one	Complete, apostilled documentation; a nostrification application	~3,500 Ukrainian-qualification applications; ~29% fully recognised (Section 2.3)	A recognition decision; no wage while waiting
MYSKILLS	Baseline vocational skill, via video-based task assessment	A one-time, in-person assessment; no documentation		A skills profile for pre-employment matching, not a credential
Jobturbo	Nothing about skill directly; accelerates job search	Engagement with intensified counselling	Nearly doubled the Ukrainian exit-to-job rate; concentrated among men, in low-skilled roles	A job placement, not a verified skill record
ValiKom / ValiKom Transfer & BVaDiG	Informally acquired competence, against a reference occupation	Documentable prior experience; an in-person, German-language appointment	2,012 participants nationally, Nov. 2018–Apr. 2023 (under 500/year)	A chamber certificate of full or partial equivalence
PraxisPass	Task-level, on-the-job performance, dated and attested	Nothing but starting the job — no diploma, no prior documentation	Continuous; Phase-1 target of 100–150 placements	Feeds ValiKom/BVaDiG chamber validation and the Externenprüfung (§45(2) BBiG) — an input, not an end-point

Chapter 4: Solution Design

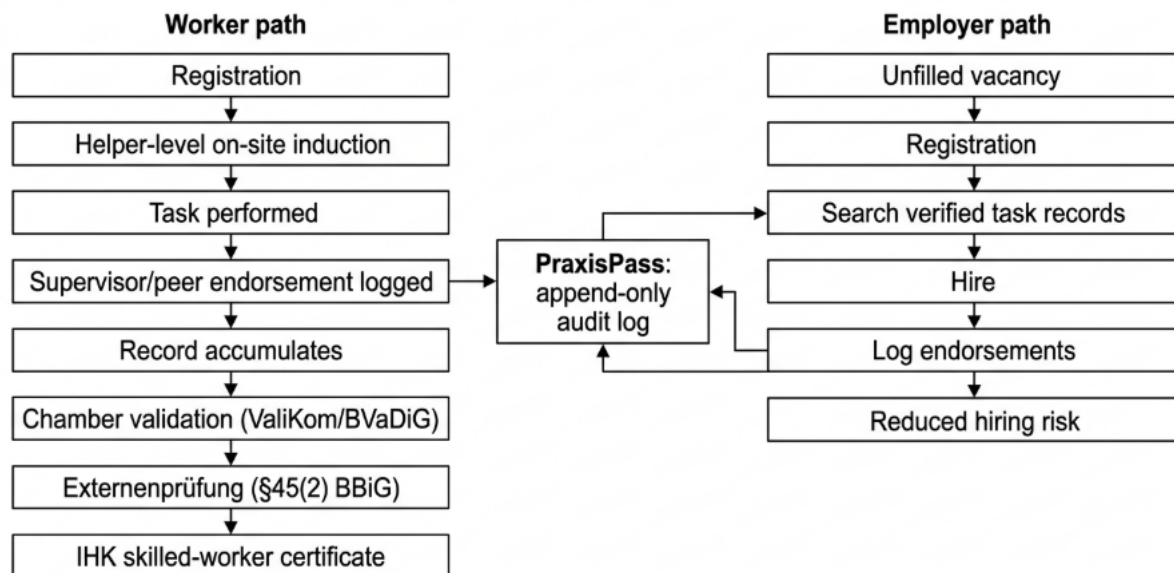
4.1 Core Concept

To resolve this paradox, a 50.6 percent vacancy-overhang rate across Germany's raw-material extraction, production, and manufacturing sector, alongside an underemployed migrant workforce of 1.1 million Ukrainian temporary-protection holders, we propose PraxisPass, an employer-trusted competence-record system. It moves skill validation off state bureaucracies built around paper and onto the factory floor, where a supervisor can watch the work happen.

The pilot targets the low-barrier entry points of the green economy: battery recycling in North Rhine-Westphalia (NRW), a plant-level labour shortage today inside a European market PwC projects will see a tenfold increase in recyclable battery material by 2040. Entry-level dismantling and sorting are helper-level (Helfer) roles: a short, employer-delivered induction, not a formal qualification, which is what makes them accessible to non-native speakers.

PraxisPass is an append-only audit log with role-based validation rights: supervisors and trained peers record what a worker did, dated and attributed, and the record can be added to but not edited after the fact. Rather than waiting months or years for a state agency to assess a foreign diploma, the bottleneck that keeps skilled migrants in survival jobs, a worker can start immediately, earn a wage, and build a dated record of tasks performed. Restricted to non-regulated green occupations, where no statutory certification is required, PraxisPass sits alongside the existing labour-market architecture rather than inside it, turning observed work into evidence an employer, and eventually a chamber, can act on.

Figure 1 — System Diagram



4.2 Two Mechanisms

PraxisPass rests on two mechanisms, addressing two distinct failures in the German industrial labour market.

1. Validation anchored to the employer, not the agency

RPL systems fail because they are static, one-time tests taken before a job starts. PraxisPass instead logs a worker's skills as they are demonstrated: trained peers and direct supervisors endorse specific, observable tasks in real time, and the endorsement is recorded permanently.

This matters because German industrial employment runs heavily on temporary work agencies (Zeitarbeitsfirmen), which have their own incentive to keep migrants in static, low-wage roles rather than document their progress, documentation would let a worker leave. PraxisPass anchors validation authority to the end-employer, the recycling plant operator, not the agency. When a worker masters a new sorting task, or completes the employer-provided high-voltage safety qualification (Arbeitsschutz-Qualifikation, see Chapter 6), the plant's own technical supervisor logs it. These endorsements accumulate into a durable record that gives the worker a direct, verified relationship with the plant operator, one that lets them bypass the agency and move to a permanent contract.

2. A ladder that ends in statutory recognition, not inside the platform

PraxisPass also builds a learn-while-working ladder, so migrants are not stuck at entry-level dismantling. A worker starts in a helper-level module, a short, employer-delivered induction, not a formal qualification, and as they complete tasks and accumulate endorsements, the platform unlocks upskilling modules and industry-specific German-language resources, so a worker can build technical German and operational skill without leaving paid work.

The ladder does not end in an internal PraxisPass credential; it ends in Germany's own statutory system. The dated, supervisor-attested record a worker accumulates is the evidentiary submission for chamber validation under ValiKom or the BVA DiG's statutory procedure, and, once enough documented experience has accrued, for admission to the Externenprüfung under §45(2) BBiG (Section 3.3). The full ladder runs: entry job → PraxisPass record → statutory chamber validation → Externenprüfung (§45(2) BBiG) → IHK skilled-worker certificate → skilled-worker wage. PraxisPass does not compete with these instruments; it supplies the evidence they need and were never built to generate.

To prevent an employer from underinvesting in training for fear that a trained worker will simply leave, PraxisPass pools training costs across participating employers rather than charging a fee on a worker's move. Employers pay into a consortium fund that reimburses training costs pro rata, whichever member firm the worker ultimately joins. This preserves an employer's return on training while meeting EU data-portability law (GDPR): the worker keeps full ownership and portability of their record, and no charge attaches to the decision to move, which avoids the no-poach and competition-law problems, and the plain unfairness, that a move-triggered fee would raise.

4.3 User Journeys

The Migrant Journey

A worker registers on PraxisPass without needing translated, apostilled diplomas. They complete a video-based baseline safety and skills assessment, built on the same logic as the German Employment Agency's MYSKILLS tool, and are matched to an entry-level green-transition job, such as battery dismantling, at a partner facility in the Ruhr. On-site training starts immediately.

As they begin earning, they log daily tasks through a mobile interface, and their supervisor and vetted peers endorse the work. Over months, the record accumulates verified entries for technical

proficiency and language skill. A job that started as a stopgap becomes a portable record a worker can use to apply for higher-tier roles, breaking the cycle of working below one's skill level.

The Employer Journey

An NRW employer facing a labour shortage registers to find workers with a verified record, rather than navigating the opaque equivalence of a foreign diploma. The employer searches the platform for workers whose logged tasks match the plant's actual requirements, reducing hiring risk: the evidence is what the worker has done, not what a foreign institution says they were trained to do.

The platform runs on a hybrid funding model. The NRW pilot draws on European Social Fund Plus (ESF+) grants and German federal green-transition subsidies earmarked for labour-market integration. After the pilot, PraxisPass moves to a B2B subscription model, charging employers a fee below what temporary-agency markups already cost them.

4.4 Validation Integrity

Trust in PraxisPass rests on employer and peer observation rather than a state stamp or a diploma's institutional pedigree, which is also its main point of exposure. Peer-to-peer validation is vulnerable to collusion: workers or supervisors could inflate each other's records.

PraxisPass addresses this with three safeguards. Every endorsement is timestamped and geo-fenced to the factory location, so it can only be logged during an active, documented shift. Plant managers audit a random, algorithmically selected sample of peer-validated entries. And each validator carries a reputation score: if a supervisor or peer repeatedly endorses a worker who then fails an audit or is dismissed for incompetence, their own score is penalised, which puts each validator's professional standing behind every endorsement they log.

The result is not a self-regulating accreditation board or an unforgeable ledger. It is an append-only audit log, with role-based validation rights, checked by people whose own credibility is at stake. That is a more modest claim than a "tamper-proof" system, and a more credible one.

4.5 Regulatory Interface

Any deployment has to draw a clean line between regulated and non-regulated occupations. Regulated professions, healthcare, law, require formal state nostrification before someone can practise, for good public-safety reasons. Large parts of manufacturing, construction, and the emerging green-transition sectors carry no such requirement: an employer can hire on demonstrated competence alone. PraxisPass operates only in this second category, as a complement to state certification, not a substitute for it.

Chapter 5: Impact and Problem Resolution

Germany's green economy cannot find manual workers while more than a million Ukrainians under temporary protection sit underemployed, held back by a recognition system that judges documents instead of demonstrated skill.

PraxisPass closes this gap in two ways. First, it makes existing skills visible: supervisors and peers document what a worker actually does on the job, giving an employer proof to hire on without waiting for documents that, under the Recognition Act of 2012, an undocumented refugee often cannot

supply (BQFG, 2012). Second, it brings newcomers into work quickly: because entry-level dismantling is a helper-level role learned on the line, a worker earns from the first shift while building a verified record and learning German. Every placement turns an idle worker into a productive one, and PraxisPass complements formal recognition rather than replacing it, covering only the non-regulated roles that need no license.

Stakeholder Impact

PraxisPass creates value for every party it touches, which is what makes it politically durable as well as socially useful. Each group gains something concrete.

Migrants gain the most directly. The platform converts idle time into paid work and into a portable, verified record of skill, restoring the link between effort and standing that the recognition system breaks. Because training happens on the job and in German, each month of work adds income, competence, and language at once, rather than another month spent waiting in a queue. This is the decent work that Sustainable Development Goal 8 (Decent Work and Economic Growth) calls for, delivered to a group the current system excludes.

That gain is not evenly available by default, and the design accounts for this directly. Roughly 60 percent of adult Ukrainian refugees in the EU are women, yet Jobturbo's own employment gains (Section 3.2) accrued disproportionately to men in low-skilled roles. A pilot built around physical dismantling is structurally exposed to reproducing exactly that pattern. PraxisPass is designed against this risk rather than around it: Phase 1 (Chapter 7) sets an explicit target of at least 40 percent of placements going to women, met through childcare-compatible shift patterns and validated pathways into sorting and quality-control roles alongside physical dismantling, so the ladder does not quietly sort women out of its higher rungs.

Employers gain a lower-risk hire. A record built by a supervisor and confirmed by peers gives them the evidence a foreign certificate cannot, removing the uncertainty that makes hiring an undocumented worker feel unsafe. They fill vacancies faster and recruit from a wider pool in a labour market they themselves describe as critically short.

The German state gains on two fronts. Socially, work is one of the strongest drivers of integration, so a credible route into it eases the tension that a visibly excluded population can create. Fiscally, the case is real, but it needs to be built in the order an applied economist would insist on, not the order that flatters the proposal most.

The Fiscal Case

Start conservative. A single adult on Bürgergeld receives €982 per month including housing (BMAS), roughly €11,800 per year foregone once a placement begins. Weigh that against the income tax the placement generates instead: the sector's gross wage runs €28,000–44,000 per year (ERI salary data), midpoint roughly €36,000, on which income tax for a single filer is roughly €5,000–6,000, itself an estimate. Bürgergeld foregone plus income tax gained together put the conservative, headline fiscal effect at roughly €17,000 per placement per year.

Even the conservative figure needs a deadweight correction. Some share of the cohort would have found comparable work without PraxisPass, and treating the full €17,000 as attributable to the inter-

vention would overstate its effect. We apply an illustrative discount of 30–50 percent, a range estimate.

Table 2. The fiscal case, per placement per year

Measure	€/year	Basis
Conservative (headline)	~17,000	Bürgergeld foregone (~11,800) + income tax on ~€36k gross wage (~5,000–6,000, estimate)
Deadweight-adjusted	~8,500–11,900	Illustrative 30–50% discount on the conservative figure, for the share of the cohort who would have found comparable work regardless

The pilot-scale arithmetic follows in three lines, on the assumptions of full benefit exit, a single-adult household, and a static wage: 125 placements × ~€17,000 conservative fiscal effect ≈ ~€2.1 million per year, gross of deadweight. Applying the 30–50 percent deadweight discount brings that to roughly €1.1–1.5 million per year. Against a one-off Phase-1 pilot cost of roughly €1.0 million, the pilot pays for itself within roughly the first year of the cohort's employment.

That pilot cost is our own estimate, built bottom-up, band €0.9–1.3 million: roughly €300,000 for platform build, €420,000 for a core team of about 3.5 FTE, €60,000 for legal work (the DPIA, works-council agreements, and audit protocol), €50,000 to cover the training co-funding gap, €70,000 for independent evaluation, and roughly 15 percent contingency on top, approximately €8,000 per placement, one-off.

Another feature is the measurability. Because the record is built from dated, logged tasks, the effect can be measured rather than asserted: how many migrants found work, how long they kept it, how many vacancies were filled, and how much the state spent per placement. A pilot that produces those numbers gives an employer, and a ministry the same concrete evidence on which to judge it.

Chapter 6: Feasibility and Financing

Legal Foundation and Co-Determination

Any system that timestamps, geo-fences and logs individual worker performance in a German plant triggers Germany's co-determination law: §87(1) No. 6 of the Works Constitution Act (Betriebsverfassungsgesetz, BetrVG) gives the works council a right of co-determination over technical devices capable of monitoring employee performance or conduct. This is not a compliance nicety; PraxisPass cannot lawfully operate on a shop floor without a works-council agreement (Betriebsvereinbarung) covering its validation and monitoring functions. Negotiating that agreement with the relevant industrial unions, IG BCE, the natural counterpart for recycling-plant operators, and IG Metall, is a named Phase-1 deliverable, not a later-phase aspiration.

The Regulated/Safety Distinction

Battery dismantling is not a regulated profession under the BQFG: no Berufszulassung (occupational licensing) is required to hire someone into the role. High-voltage dismantling work is, however, subject to Arbeitsschutz-Qualifikation, an employer-provided, legally required safety qualification under German occupational health and safety law, distinct from a licence to practise a trade (Deutsche Gesetzliche Unfallversicherung, 2021). PraxisPass records that an employer has provided, and a worker

has completed, this safety qualification; it does not replace it, and confers no licence PraxisPass has no authority to grant.

Temporary Protection as a Closing Window

EU temporary protection for Ukrainians runs to 4 March 2027, and the Council recommendation of September 2025 pushes member states to transition protection-holders onto employment-based national residence statuses before then. From 2027, the ability to demonstrate employability therefore increasingly conditions the right to remain, not only the right to work. A verified, dated competence record is accordingly not only labour-market infrastructure; it is status infrastructure, evidence a worker can carry into a residence-status application as readily as into a job application. This raises the stakes of PraxisPass's design integrity considerably.

Financing Feasibility

PraxisPass is feasible because it starts where the legal barriers are lowest and the demand is most certain. Dismantling is non-regulated, so an employer may hire on demonstrated competence rather than a certificated, and the demand is guaranteed by law: Regulation (EU) 2023/1541 requires recyclers to recover a rising share of every battery's lithium (50 percent by 2027, 80 percent by 2031), making domestic dismantling capacity a legal obligation (European Parliament & Council, 2023).

The financing model follows the same logic. Each party pays in proportion to what it gains. Employers who receive a lower-risk hire and a faster route to productivity pay a per-seat fee for access to verified candidates and for hosting validations on their lines. The training that brings a worker up to speed is covered by public programmes that already exist, including the Federal Employment Agency's training vouchers and the European Social Fund Plus and Just Transition budgets earmarked for labour-market integration. Recycling operators, whose compliance with EU targets depends on a staffed line, contribute through consortium membership. Grant money is needed only at the outset, to build the platform and run the first cohort; after that, running costs shift onto employers and existing public instruments.

This design keeps the model both affordable and self-sustaining. A per-seat fee set below the markups that temporary agencies charge is already cheaper than the status quo, in which employers pay those agencies to keep the same workers in the same low-paid roles. PraxisPass costs less and moves workers upward, so the employer saves money and retains staff. The economics also improve with scale. Every employer that joins lowers the cost of the next validation, and every successful cohort strengthens the case for public co-funding by producing outcomes that can be counted. The exact fee and the public share still need to be tested, which is the purpose of the pilot, but the direction is clear: a platform that pays for itself out of the value it creates rather than depending on grants.

Scalability

The pilot is intentionally small, but it is designed to grow, because the conditions that make it work in the Ruhr repeat across Europe. The battery value chain runs on into manufacturing at Poland's gigafactories near Wrocław, France's "Battery Valley" in Hauts-de-France, and Sweden's northern plants, each facing the same shortage of manual labour beside a resident migrant population the system recognition underuses. Northern Sweden makes the point sharpest: staffing its remote sites has proved so hard that investment has stalled, showing what happens when factories arrive without a

workforce. A single protocol, proven in the Ruhr, could extend to each site with local partner handling recruitment.

The model also transfers beyond the battery sector. Its mechanism, recording competence through observed work in occupations that require no licence, does not depend on the specific task, so it applies equally to circular-economy sorting, heat-pump pre-assembly, or building retrofits, with only the job descriptions changed. Czechia's shift from combustion-engine to electric-vehicle production shows the same logic at work on a resident rather than a migrant workforce. Because EU law makes recycling capacity a continent-wide requirement, the anchor sector alone gives the model years of room to expand before it is transposed at all. The principle is simple and low-risk: prove the model once in North Rhine-Westphalia, then follow a value chain that already exists rather than inventing new demand.

Chapter 7: Implementation Roadmap and Risk

Implementation Plan

PraxisPass will roll out in three phases. Each phase must meet clear targets before the next begins, so that expansion is earned by evidence rather than assumed.

Phase 1: NRW pilot (months 0 to 18)

The pilot focuses on a single sector, battery-recycling dismantling in the Ruhr, with a small group of recycling employers. Delivery partners include the operators themselves, a regional chamber or the local employment agency to channel public funding, and a migrant-support organisation to handle referral and safeguarding. The goal is to prove that employer-led validation produces real hires and that those hires last. Three targets measure success: 100 to 150 migrants placed into paid roles through a verified PraxisPass record; a six-month retention rate of at least 70 percent among them; and at least 40 percent of placements going to women, supported by childcare-compatible shift patterns and by sorting and quality-control roles offered alongside physical dismantling (Chapter 5). A fourth measure, the proportion of audited records that hold up without dispute, tracks quality throughout.

Phase 2: multi-sector NRW (months 18 to 36)

The model stays in the same region but expands into one or two more non-regulated green occupations, such as circular-economy sorting, to confirm it transfers before any move abroad. The targets here are a threefold increase in participating employers and, most importantly, a majority of running costs covered by employer fees and existing public funding rather than seed money. Meeting this financial threshold is the gate to Phase 3: the model must show it can pay for itself before it travels.

Phase 3: national and EU scale (months 36 onward)

The final phase extends the model along the battery belt into a second member state, beginning with a manufacturing cluster that shares the same shortage and migrant supply. New sites operate against the audited pilot protocol rather than improvising their own. Governance remains deliberately simple: a central team owns the validation standard and the audit, while local partners handle hiring and safeguarding, so that quality travels with the model. Any phase that misses its targets is revised or halted before more is committed.

Risks and Mitigation

We identify eight principal risks to PraxisPass and the safeguards built into its design to address them. Two of these, fraud and quality dilution, are the most serious, because a competence record is worthless the moment people stop believing it, and the response to both rests on a single audited standard rather than on trust alone.

Table 3. Risk register

Risk	Description	Response
Gendered placement skew	Physical-dismantling pilots have historically produced male-dominated placements (Jobturbo, Section 3.2), leaving most of the 60% of adult Ukrainian refugees who are women no better served than the status quo	Hold the Phase-1 target of $\geq 40\%$ of placements to women as a gate, not an aspiration; deliver it via childcare-compatible shifts and sorting/quality-control roles validated alongside physical dismantling (Chapter 5)
Works-council non-agreement	Timestamped, geo-fenced performance logging triggers co-determination rights under §87(1) No. 6 BetrVG; without a works-council agreement, the platform cannot lawfully operate on a German shop floor	Make negotiating a works-council agreement (Betriebsvereinbarung), jointly with IG BCE and IG Metall, a named Phase-1 deliverable, completed before any worker data is collected
Employer non-adoption	Employers may be wary of an unfamiliar record or reluctant to host validations, leaving the platform without the validators it relies on	Begin with a small group of committed employers already facing shortages and recycling obligations; keep first validations low-cost and quick; price against measurable productivity gains, not promises
Validation fraud or collusion	Peers or supervisors might inflate or trade endorsements, undermining the trust that gives the record its value	Rely on the safeguards in Section 4.4: timestamped, location-verified logging; random manager spot-checks; a validator reputation score that penalises endorsements that later fail audit
Confusion with statutory recognition	PraxisPass could be mistaken for, or drift into, licensing of regulated professions, creating legal risk for workers and employers	Confine the platform to non-regulated occupations (Section 4.5); present it as a complement to formal recognition; refer regulated-profession cases back to the state procedure
Data protection and safeguarding	Handling vulnerable people's personal and performance data risks GDPR breaches, surveillance, or use of validation as leverage over precarious workers	Collect minimum data; give workers ownership of a portable record; obtain GDPR-compliant consent; provide dispute/correction rights; keep validation separate from employment status
Funding sustainability	Slow employer subscription uptake could leave the model dependent on seed funding beyond the pilot	Transfer running costs onto employers and existing public funds in stages; make cost-recovery an explicit Phase 2 target; tie expansion to paying demand, not grant availability
Quality dilution at scale	As the network spreads across sites and sectors, standards could slip and the record could lose its meaning	Maintain the standard centrally through one audited protocol; license each new site against the pilot benchmark; keep validation integrity a required target at every phase (Chapter 7)

These risks are not hypothetical; each has undermined skills platforms and informal-recognition schemes before. PraxisPass's response is to build its safeguards in from the pilot rather than add them once problems appear. Its hardest challenge is not technical but a matter of trust in what each record claims, and the platform's audited standard and staged targets exist precisely to protect that trust.

Chapter 8: Conclusion

This paper began with a scene that should not exist: a battery-recycling line running under capacity a few kilometres from skilled workers who cannot get hired. We have argued that this is not a coincidence but the predictable output of a labour-market architecture that verifies paper rather than performance, and that the fix is not more funding for the existing recognition system but a different logic of trust altogether.

Return to the Ukrainian mechanical engineer from Chapter 1. On the account this paper develops, his route would not run through a diploma office, because no diploma office can act on a phone full of photographs. It would run through the ladder built in Chapters 3 and 4. He registers, and within his first shift enters a helper-level dismantling role at a Ruhr recycling plant, work well below his training, but paid, and logged from day one. His supervisor endorses what he actually does, task by task; the technical judgment his engineering training gave him shows up in how quickly he moves onto more demanding sorting and diagnostic tasks, each one dated and attributed in his record. Once that record documents enough experience at a sufficient level, it becomes his submission for chamber validation under ValiKom or the BVaDiG's statutory procedure, and eventually his basis for admission to the Externenprüfung under §45(2) BBiG — not because his diploma finally reached Germany, but because the plant floor generated the evidence his diploma never had the chance to. On this account he ends not as a delivery cyclist with a phone full of photographs, but as a certified skilled worker, paid accordingly, in a plant that no longer runs at half capacity for want of hands.

PraxisPass operationalises that different logic. By anchoring skill validation to the factory floor, where supervisors and peers can observe and endorse a worker's competence in real time, it replaces a system of paper trust, which by design excludes displaced workers who arrive without complete documentation, with a system of performance trust, which asks only whether the work was done, and done well. This is not a rejection of formal credentialing; regulated professions still require, and should require, statutory nostrification. It is a recognition that a large share of Germany's green-labour deficit sits in occupations where that requirement was never legally necessary in the first place, and where a faster, alternative mechanism can operate fully within the law.

The paradigm shift this represents matters beyond the individual worker it places into a job. For migrants, it converts idle time into paid work and a portable record of demonstrated skill, restoring the link between effort and standing that the current system severs. For employers, it converts hiring risk into observable evidence, at a moment when EU battery regulation makes staffing recycling lines a legal obligation rather than a discretionary choice. For the German state, it converts a population currently classified as a social cost into a contributing, taxed labour force in precisely the sectors the climate transition most needs staffed.

None of these gains, however, are unique to North Rhine-Westphalia or to battery recycling. The same shortage of manual, non-regulated green labour, sitting beside the same underused migrant populations, recurs along the length of Europe's battery value chain, from Poland's gigafactories to France's Battery Valley to the wider electrification of manufacturing across the continent. Proven once in the Ruhr, the mechanism PraxisPass introduces, performance trust in place of paper trust, is not a local fix. It is a transferable protocol for how Europe's green transition can staff itself with the migrant workforce it already has.

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AI Use Declaration

The research underlying this paper was conducted and fact-checked by the project team. The writing was produced throughout in close collaboration with AI tools, which were used for drafting, structuring, and language editing across all sections of the manuscript.