Towards a just transition for workers in the built environment in Europe

Building materials and on-site construction sectors

Annex I: Country fiche - Germany

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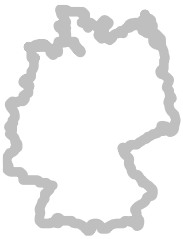

Country Fiche
Germany

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1. At a glance[1]

Strengths and Opportunities
• Opportunities in construction sector: ○ The decarbonisation push is creating strong demand for skilled workers in energy-efficient renovation and digital construction tools (e.g., BIM), supported by Germany's robust vocational training system and collective agreements that improve wages and working conditions. Eastern and northern regions are expected to benefit most from job growth. ○ Industrialised construction and offsite construction models are being increasingly implemented to respond to construction demands and the ageing and shrinking workforce. According to the Bundesverband Deutscher Fertigbau (BDF), the share of prefabricated homes among new approvals reached 26.1 percent in 2024. While this may decrease the demand for on site labour, it also creates more demand for skilled workers and digitalised systems. Hence better jobs may be available in the German construction sector. ○ The construction sector in Germany is strongly shaped by collective agreements and labour unions, that play a central role in workers rights and social dialogue. Collective agreements for the German construction industry are generally binding, meaning they apply to all employers and employees in the sector, regardless of their membership. This means that new start ups and older construction companies all benefit equally from the labour agreements. ○ Germany has huge opportunity for serial renovation due to the large building stock of Plattenbau housing, particularly in Eastern Germany. These are well suited for standardised offsite/industrialised renovation approaches which relatively low costs. ○ Politically, the majority of German states government are currently politically left and support the just transition, suggesting that there is a high potential for new social policies. ○ The majority of businesses in the German construction industry are SMEs, with only 1.2% having more than 100 employees, creating more stability, resilience and also opportunity for innovation. • Opportunities in the building materials sector: ○ The decarbonisation of materials industries (steel, cement, timber, glass) is creating new demand for skilled technical labour in hydrogen-based steelmaking, carbon capture, and engineered timber production. ○ Public investment and industrial policy support (e.g. €6 billion Industrial Decarbonisation Programme 2025, National Hydrogen Strategy) are driving large-scale projects such as Salzgitter's SALCOS and Thyssenkrupp's H_2-DRI pilot, securing employment in regions traditionally dependent on heavy industry. ○ Circular construction is a growing movement in Germany with national strategies such as the national circular economy strategy and local initiatives such as circular berlin. Several German

[1] The core construction sector is aAnnex I: Country fiche - Francessessed in detail in all ten countries, while the depth of analysis varies in the building material industries, with the one or two biggest industries (measured by volume of material output produced in tons) analysed per country. For Italy, the Netherlands, Czechia, Denmark and Ireland, the analysis focuses on either steel or cement, depending on which material has the highest output. Germany, France, the United Kingdom, Poland, and Spain are subject to a deeper analysis, including steel or cement and an additional industry (either timber or glass) selected based on its importance in material output.

cities have declared themselves as either circular or zero waste and are implementing various local strategies and action plans for a more circular economy.
    - The circular-construction boom and the increased demand for wooden products all over the EU offers growth potential in engineered wood, modular prefabrication, and bio-based materials manufacturing, particularly in southern and central Germany (Bavaria, Baden-Württemberg, Thuringia). Germany has also launched a timber construction initiative which aims to emphasize timber's role in modular construction and carbon storage.
    - Due to its significant industrial base, Germany has the potential for heavy industry decarbonisation projects. In 2024 the steel giant ArcelorMittal was offered billions of euros in subsidies yet decided to suspend plans to transition to green steel production. The company had previously pledged to reduce CO_2 emissions by 35% in its European operations by 2030 and achieve carbon neutrality by 2050. On the other hand, more positive examples have also occurred such as Power4Steel steel decarbonization project from the SHS Steel Group, which is one of Europe's largest decarbonisation initiatives. Further Holcim's carbon2business carbon capture project aims to create one of the worlds first climate neutral cement plants by the end of the decade, aiming to carbon capture 1.2 million tonnes of co2 per year.

Weaknesses and Threats

- Challenges in construction sector:
    - Labour shortages, ageing workforce, and poor working conditions (leading to e.g., early retirement, mental health strain) threaten sustainability of employment.
    - German industry has experienced several consecutive years of decline, which has also impacted the construction sector in terms of building investment and construction demand.
    - The majority of the German construction industry is made up of SMEs. While this is positive, smaller companies SMEs often do not have the financial capabilities to provide training and upskill workers. Further, subcontracting weakens labour rights enforcement, especially for migrant workers.
    - The construction sector faces rising operational cost and, high energy costs.
    - Despite its efforts to become increasingly digitalised, the construction sector in Germany is still slow to adopt new technologies and practices. The continuous growth of digitalisation is expected to present new opportunities in the future.
- Challenges in the building materials sector:
    - There is increasing risk of job losses and regional decline in traditional steel and cement regions (Ruhrgebiet, Saarland) as blast furnaces and clinker plants close or downsize ahead of hydrogen and CCS capacity coming online. Existing workforces often lack qualifications in digital process control, hydrogen technology, or advanced materials, and retraining provision is uneven across regions. This is exacerbated by fluctuating energy prices and incomplete hydrogen infrastructure create investment hesitancy, delaying transformation and threatening employment stability.

Key organisations

- IG BAU (Industriegewerkschaft Bauen-Agrar-Umwelt, Industry Union Construction-Agriculture-Environment)
    - Trades Represented: Construction, agriculture, and environmental sectors.
    - Tactics: Negotiates collective agreements (e.g. loss allowance for roofers during extreme heat), supports migrant and pseudo-self-employed workers, advocates for flexible retirement and retraining options, and pushes for stronger workplace representation.
    - Role in Just Transition: Central in shaping fair labour standards, protecting vulnerable workers, and ensuring climate policies include worker protections.
    - Key Blockers: Declining participation in works councils, subcontracting chains that dilute accountability, and limited enforcement capacity.
- DGB (Deutscher Gewerkschaftsbund, German Trade Union Association)
    - Trades Represented: Umbrella organisation for eight unions, including IG BAU and IG Metall.
    - Tactics: Policy advocacy, research (e.g. DGB Index Gute Arbeit), and coordination across sectors.
    - Role in Just Transition: Influences national labour policy and promotes worker-centred climate action across sectors.
- IG Metall (Industrigewerkschaft Metall, Industry Union Metal)

- Trades Represented: Metal, electrical, and parts of the construction supply chain (e.g. HVAC, prefab manufacturing).
- Tactics: Collective bargaining, training initiatives, and advocacy for fair working conditions in industrial segments of the supply chain.
- Role in Just Transition: Supports upskilling and protects workers in material production and prefab sectors.
- Key Blockers: Fragmented supply chains and uneven union coverage in emerging green industries.

- Verbändebündnis Wohnungsbau
  - Alliance of organisations focused on housing construction and organisers of the key housing construction event.
  - The alliance includes IG BAU alongside the tenants' union (DMB), the housing industry body (GdW), the construction material retailers' association (BDB), the real estate association (BFW) and a few other key organisations.
  - The alliance of associations demands better policies for the housing construction sector including more funding and fewer standards.
- Klima-Allianz and Gebäude Allianz
  - The climate alliance is Germany's broad civil society alliance for climate justice. Similarly, Germany has a building alliance, which is broad coalition of over 30 environmental organizations, consumer initiatives, associations, trade unions, and companies. Together they advocate for a socially just transition for a climate neutral building stock.

Key initiatives and partnerships

- Vocational Education & Training (VET) Institutions
  - Organisations like Bildungszentren des Baugewerbes (BZB, Education Centres of the Construction Industry) work with businesses to deliver training in sustainable construction methods.
  - Partnerships with academia and public agencies help integrate climate-related skills into curricula.
- Civil Society Organisations (CSOs)
  - Initiatives like Bauhandwerkerinnen (Women in Construction crafts), Klischeefrei (Cliché-free), and Handwerkerinnenhaus Köln (Women Craftsworkers' House Cologne*)* promote inclusion of women and underrepresented groups in construction, often in collaboration with NGOs and educational institutions.
- Collaborations between labour unions and climate organisations widely exist. An example is the Klima-Allianz Deutschland (Climate Alliance Germany) which unites over 150 organisations, including IG BAU, DGB, and several environmental NGOs (e.g. Deutsche Umwelthilfe, Germanwatch). Through its "Building Transition Working Group", unions and climate NGOs jointly advocate for:
  - worker-centred energy renovation policies,
  - stronger labour and safety protections during the green transition, and
  - social safeguards in housing decarbonisation.

Hotspots of a Transition in the Construction Sector

Germany

Legend

On-site construction:

Expected job creation

Building materials:

Steel

Modernisation of production site and reskilling of workers

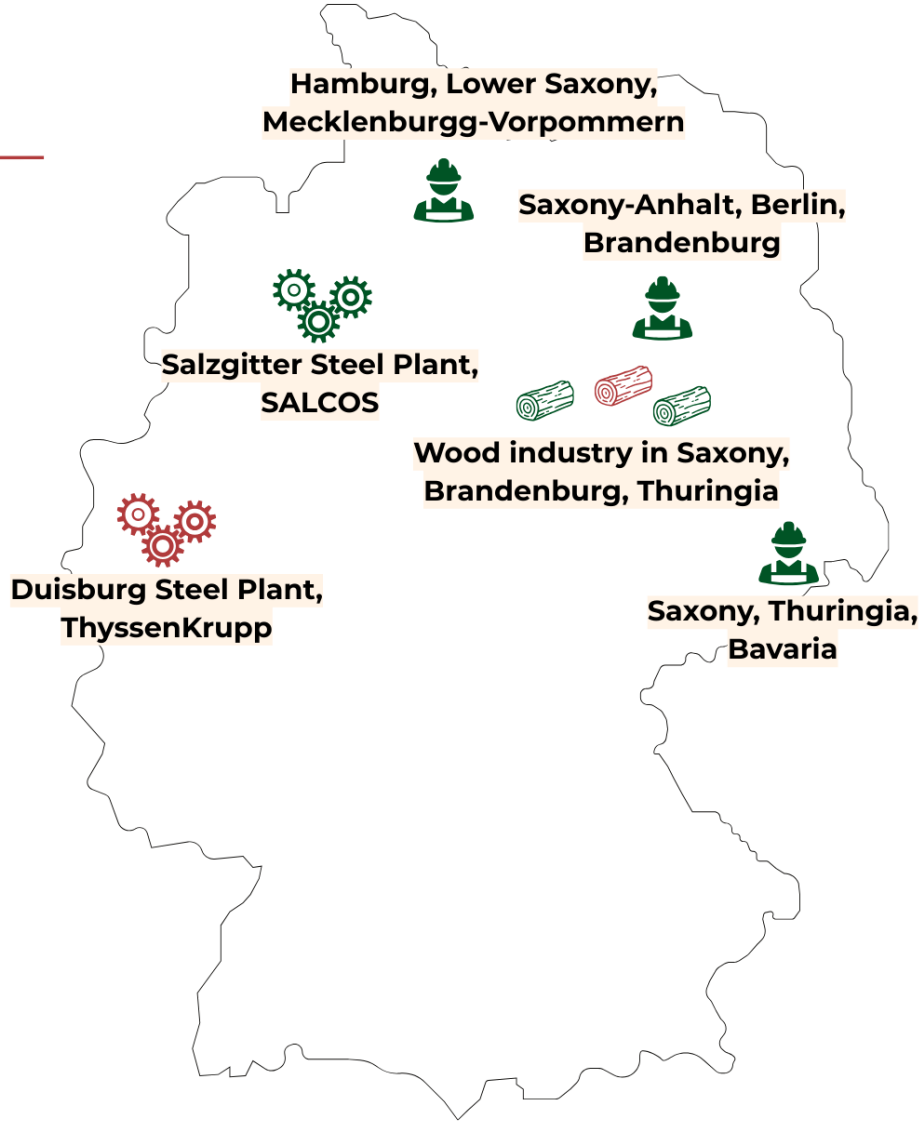
Closure and/or repurposing with redundancy plans

Timber

Decarbonisation of production site and reskilling of workers

Closure and/or repurposing with redundancy plans

Not covered in the analysis: cement, glass (see footnote 1).



2. The broad construction sector

The construction sector today

Economic indicators (2023)	Employment (2023)	Workforce characteristics
Construction (NACE F): • Number of enterprises: 382,861 • Average employment size 7,3 million • Value added (million € per year): 169,679 (4.3% of GDP) • Net turnover (million € per year): 425,691 Architectural and engineering activities; technical testing and analysis (NACE M71): • Number of enterprises: 121,653 • Value added (million € per year): 53,773 (1.3% of GDP) • Net turnover (million € per year): 120,809	• Total employment in the construction sector: 2,780,641 • Organisation/structure of the construction sector and its supply- and value-chain including materials sector: ○ The ecosystem is fragmented but deeply interlinked, comprising around 90% SMEs, which together account for roughly 80% of sectoral employment. The value chain spans on-site construction and finishing trades, engineering and design services, and upstream material industries such as steel, cement, glass, and timber, which supply about one-third of total construction input value.	• Age: ○ 24% of the construction workforce are aged 55+, indicating an ageing workforce. ○ 10% of workers are under 25, with higher youth representation (15%) in finishing trades. • Gender: ○ The sector is strongly male dominated. Only 14% of workers are women overall. ○ Just 2.2% of employees in narrow construction are women. ○ Women are better represented in planning and engineering roles (e.g., 28% in planning, 29% of engineers). • Education Levels: ○ Skilled trades typically require EQF Level 3–4 (vocational training). ○ Technicians and site managers: EQF Level 5–6. ○ Engineers, architects, energy consultants: EQF Level 6–8 (university degrees). • Nationality: ○ 22% of employees in narrow construction have foreign nationality. ○ Employment growth since 2022 has been driven exclusively by foreign workers. ○ 86,000 posted workers from abroad were active in 2024, mainly from Eastern Europe. • Women: ○ Schemes to attract women into technical professions. • Youth (16–25): ○ Strong apprenticeship system supports youth entry into the sector. ○ Legal framework allows youth participation in works council elections from age 16. ○ Recruitment of young people remains a priority, though growth has slowed recently due to demographic and economic factors.

The legislative framework for decarbonisation and its impacts on workers

Decarbonisation policies and emission timelines and targets
• Buildings Energy Act (GEG, 2020): Sets binding energy performance standards for new and existing buildings. Requires newly installed heating systems to cover at least 65% of demand with renewables. • Federal Climate Protection Act (KSG): Translates Germany's climate neutrality goals into legally binding sector-specific emission reduction targets, including for buildings. • National Fuel Emissions Trading System (BEHG): Introduces CO_2 pricing on heating fuels, increasing the cost of fossil-based energy in buildings to incentivize cleaner alternatives. • Federal Funding for Efficient Buildings (BEG): Provides grants and low-interest loans via KfW to support energy-efficient new construction and retrofits, going beyond EU requirements. • 2030 goals: Reduce emissions by minimum 65% (compared to 1990). • 2050 goals: Reduce emissions by minimum 88% by 2045 (compared to 1990); Reduce primary energy demand in buildings by 80% (compared to 2008); After 2050: Negative net-emissions in Germany.

Impacts on the construction industry
• **(Expected) impacts on the construction sector and investments:** Investment and activity levels: Germany's push for energy-efficient renovation is expected to double the renovation rate by 2031, requiring €28 billion annually in additional investment. This will significantly increase demand for construction services, especially in trades like insulation, HVAC, and glazing. • **(Expected) impacts on employment, skills and activity of on-site construction workers:** Employment and labour volume: By 2035, around 767,200 workers will be needed to support climate-related construction activities, with one-third of this demand in structural and civil engineering, and 58% of whom will need to be skilled workers. Therefore, the investment towards climate neutrality in Germany will create new jobs and the construction sector will see a rise in skilled labour demand, especially in eastern and northern Germany. • **Skills and workforce composition:** Decarbonisation is driving demand for mid- to high-level qualifications, digital skills (e.g. BIM), and knowledge of sustainable construction methods. The workforce will need continuous upskilling, especially in SMEs, which currently lack resources to train workers adequately.

Towards a Just Transition for Construction Workers

Just transition vision in construction

• **Collective Agreements:** Set binding standards for wages, working hours, and employment terms for all construction workers, regardless of union membership. They are negotiated by regions:
  ○ Federal Framework Collective Agreement for the Construction Industry (BRTV)
  ○ Collective Agreement on Iron and Steel

- Collective Agreement on Glass
- Collective Agreement on Timber and Plastics
- Collective Agreement on Cement and Lime
- Collective Agreement for Minimum Wages (TV Mindestlohn): Establishes wage floors for construction workers, often extended beyond formal expiration through the Nachwirkung principle.
- SOKA-BAU (Paritarian Social Fund): A social partnership fund covering: (1) Holiday pay equalisation (workers keep leave rights even when changing firms), (2) Vocational training subsidies, and (3) Supplementary pension (BauRente).
- Occupational Safety & Health (BG BAU / ArbSchG / Baustellenverordnung): The statutory accident-insurance body (BG BAU) enforces OSH regulations, provides training, PPE subsidies, and safety audits. Construction firms must appoint safety coordinators on large sites.

- **Country-level policies for just transition:**
  - Work 4.0 Dialogue (Arbeiten 4.0, 2016–ongoing): National platform led by BMAS engaging unions (IG BAU, DGB) and employers (ZDB) to shape the future of work under digitalisation and decarbonisation, focusing on fair transitions and social security.
  - Federal Climate Protection Act (Klimaschutzgesetz, 2019, amended 2023): Establishes legally binding emission reduction targets for all sectors, including buildings; underpins the integration of climate goals with social and labour considerations. This, however, focuses on the expert commission supporting the government in the assessment and adjustments of the Act.
- **Just transition considerations in relevant policy debates:** In development: Just transition and quality job creation are partially addressed in climate and labour policy discussions. IG BAU and other unions advocate for worker-centred climate action, including protections against heat stress and early retirement options. However, policy gaps remain, especially in SME support, migrant worker protections, and regional training infrastructure. The lack of robust monitoring systems and declining workplace representation (e.g. fewer works councils) limit the effectiveness of just transition efforts.

Labour implications of the decarbonisation agenda
• **Labour rights challenges:** The sector faces persistent issues such as irregular pay, bogus self-employment, early retirement due to physical strain, and mental health stress from labour shortages. Oversight is limited due to understaffed inspectorates and complex subcontracting chains. • **Movement between trades:** There is limited evidence on mobility between traditional construction and construction building material sectors. • **Geographical distribution of the implications:** Eastern and Northern Germany are expected to be affected most, with construction jobs accounting for over 7% of total employment in some rural areas. These regions will see strong demand for renovation and climate adaptation work, especially in structural and civil engineering. However, rural areas and Eastern Germany also face training infrastructure gaps, lower wages, and employment instability. SMEs in these regions struggle to provide reskilling and adapt to green construction demands. Generally, urban centres may have better access to training and innovation hubs, while rural areas face greater barriers to workforce development despite high demand.

Benefits for workers brought by the green transition in the construction sector	Disadvantages for workers brought by the green transition in the construction sector
• Job creation: The green transition is expected to generate significant employment, with around 255,700 workers needed by 2035 in the broad construction sector, especially in finishing trades. • Upskilling opportunities: Demand for new skills in energy-efficient renovation, digital tools (e.g. BIM), and sustainable construction methods is rising, supported by Germany's strong VET system. • Improved wages and conditions: Apprenticeship wages have increased (+6.3% in 2024), and collective agreements (e.g. heat-related loss allowances) are improving working conditions.	• Labour shortages and ageing workforce: High share of workers over 55 and declining apprenticeships threaten workforce sustainability. • Poor working conditions: Physically demanding jobs lead to early retirement, mental health issues, and financial insecurity. • Unequal access to opportunities: Migrant and posted workers face exploitation, and SMEs lack resources for re/upskilling.
Ways to reinforce these	**Ways to reduce these**
• Expand access to training and apprenticeships, especially in SMEs and rural areas. Strengthen regional training hubs and training in rural areas which can reduce financial barriers related to travel and accommodation. • Strengthen collective bargaining coverage and workplace representation. Set minimum standards on pay, trainings, healthy and safety and climate related working conditions. • Align labour and climate policies to ensure job quality is central to green transition strategies. Develop benchmarks to ensure that job quality is met and ensure that climate targets are translated into quantified workforce and skills needs. Ensure alignment between construction investment and trainings as well as skills supply.	• Improve monitoring and enforcement of labour rights, especially in subcontracting chains. • Invest in inclusive recruitment and support for underrepresented groups (e.g. women, migrants, youth).

Workers groups most affected
• **Professional groups in the core construction business and supply-chain who have the highest environmental footprint and how these are affected:**   ○ Heavy machinery operators, concrete and structural workers, and on-site installers have high material-related emissions due to intensive use of cement and steel

- Kiln operators, process controllers, maintenance technicians, and quarry workers in cement industry: Most affected by decarbonisation technologies (CCS, alternative fuels, low-clinker cement); require upskilling in process automation and emissions monitoring.
- Blast furnace operators, coke and sinter plant workers, rolling mill operators, and metallurgical engineers in the steel industry as well as furnace operators, batch preparers, and maintenance electricians in the glass industry: Affected by the switch to electric and hydrogen furnaces.
- Sawmill operators, CNC machinists, prefabrication and assembly technicians in the timber industry: Positively affected by rising demand for engineered wood (CLT, glulam) and modular construction.

- **Groups where most training is needed and what kind of training:**
  - **On-site Construction Workers**: Need training in energy-efficient renovation, including: Insulation installation Heat pump systems; Advanced glazing; HVAC systems; Prefabricated and modular construction methods.
  - **Helpers and Low-Skilled Workers:** Require basic construction skills plus green construction techniques to transition into more sustainable roles.
- **Gaps in skills development:** Renovation Skills (Heat pump installation, Façade and roof insulation, Window fitting and sealing, etc)
- **Hotspots of need:** Eastern and Northern Germany: High construction employment but limited training infrastructure; SMEs Nationwide: Lack capacity for upskilling and administrative support; Migrant and Posted Workers: Often excluded from formal training and vulnerable to exploitation.

Workers positively affected	Workers negatively affected
• Skilled tradespeople: HVAC installers, insulation specialists, electricians, and façade workers • Energy consultants and planners	• Older manual labourers • Migrant and posted workers: Often face precarious employment, underpayment, and exploitation due to weak oversight and complex subcontracting chains. • Low-skilled workers in SMEs: due to lack of access to upskilling and resources in small firms.

Existing protection mechanisms

• **Existing mechanisms to protect or reinforce labour rights/conditions during the transition:**
  ○ Skills Development Opportunities Act (QCG): Allows / subsidises further vocational training for employed workers, especially those in professions facing structural change or where there are skill shortages.
  ○ Skilled Workers Immigration Act: Helps bring in skilled foreign workers in shortage professions including construction managers.

- Collective Agreement on Weather / Climate-related Working Conditions (IG BAU): The union (IG BAU) has negotiated (or is advocating) collective provisions for outdoor construction workers regarding heat / cold etc., e.g. stopping work at high temperatures, better compensation or allowances. An official agreement was reached only recently (according to IG BAU) that confirms that when temperatures rise above 33 degrees, workers in construction receive up to 50 hours of paid leave during summer months with 35% of social insurance costs covered by the company. A similar agreement already exists for labour under cold weather circumstances in the winter months. Further, if the air temperature in a workroom exceeds 26 degrees, protection measures such as providing ventilation systems and fans, using flex time and relaxing clothing rules should be implemented.
- Subcontracting liability in the construction sector: The general contractor at the top of the chain is liable for ensuring that all subcontractors on the site pay the required wages and contributions.

- **Existence of gender-/age group-/workers group-specific measures:**
  - Weiterbildungsförderung Beschäftigter: Essentially: continuing training for older, low-qualified, employed workers (45+). Support via the Federal Employment Agency (Arbeitsagentur).
  - Faire Mobilität ("Fair Mobility"): Provides information and rights awareness targeted at posted / mobile / migrant workers in sectors including construction — including minimum wage, collective pay, allowances, accommodation etc.
- **The role of trade unions/construction businesses in professional development (and implementation costs):**
  - **Trade Unions:** Advocate for training standards, negotiate collective agreements
  - **SOKA-BAU:** Fund vocational training, reimburse training costs. Implementation Costs of €402 million (2019). Financed through 2.4% payroll levy from construction firms.
  - **Construction Firms:** Invest in apprenticeships, adopt green construction practices. Spend about €20,855 per apprentice
  - **Government:** Provide subsidies for continuing education and training, about €430 million (2019)

Specific measure #1	Specific measure #2
• Bau-Rente: BauRente is a statutory pension scheme tailored for the German construction sector. It ensures that construction workers, who often have fragmented employment histories due to the nature of the industry, receive consistent retirement benefits.	• Faire Mobilität (Fair Mobility): Faire Mobilität is a counselling and information service aimed at posted workers in Germany. Operates under the German Posted Workers Act (AEntG) and EU regulations on labor mobility.

3. The construction material supply chain

In focus: Decarbonising construction building material – steel		

• **Thyssenkrupp Steel Europe (TKSE)**
  ○ Crude steel production: ~11 Mt/yr
  ○ Net sales: ~€10,7 bn (2023/2024)
• **Salzgitter AG**
  ○ Crude steel production: ~5.7 Mt/yr
  ○ Total sales: ~€10,7 bn (2023)
  ○ Sales from stell production and steel processing: ~6,6 bn
• **ArcelorMittal Germany**
  ○ Crude steel production: ~28,4 Mt/yr (2023) in Europe, ~55,6 Mt/yr (2023) total
  ○ Total sales: US$68,3 bn (2023)
• **Dillinger (Dillinger Hütte / SHS group)**
  ○ Crude steel production: ~2,3 Mt/yr (2024)
  ○ Total sales: ~€3 bn (2024)
• **Saarstahl / Stahl-Holding-Saar (SHS)**
  ○ Crude steel production: ~1,8 Mt/yr (2024)
  ○ Total sales: ~€2,9 bn (2024)
	• **Thyssenkrupp Steel Europe (TKSE)**
	  ○ Workforce ~27,000
	• **Salzgitter AG**
	  ○ Workforce ~25,000
	• **ArcelorMittal Germany**
	  ○ Workforce in Europe ~50,000
	  ○ Total workforce ~127,000
	• **Dillinger (Dillinger Hütte / SHS group)**
	  ○ Employees in Germany: 3,600 (2024)
	• **Saarstahl / Stahl-Holding-Saar (SHS)**
	  ○ Workforce ~5500
	• Relevance of enterprise in construction supply-chain (how much of the material is used in construction)
	  ○ Construction is the single largest steel end-use sector in Germany (~33% of steel consumption goes into construction). So the steel these firms produce is heavily used in construction (structural steel, reinforcement, plates, profiles, building components).
		• Age:
		  ○ 18.5% are aged 55+, indicating an ageing workforce. 10% of workers are under 25, with higher youth representation (15%) in finishing trades.
		• Gender:
		  ○ The sector is strongly male-dominated. Only 14% of workers are women overall. Just 2.2% of employees in narrow construction are women. Women are better represented in planning and engineering roles (e.g., 28% in planning, 29% of engineers).
		• Education Levels:
		  ○ Skilled trades typically require EQF Level 3–4 (vocational training). Technicians and site managers: EQF Level 5–6. Engineers, architects, energy consultants: EQF Level 6–8 (university degrees).
		• Nationality:
		  ○ 22% of employees in narrow construction have foreign nationality. Employment growth since 2022 has been driven exclusively by foreign workers. 86,000 posted workers from abroad were active in 2024, mainly from Eastern Europe.
		• Youth (16–25):
		  ○ Strong apprenticeship system supports youth entry into the sector. Legal framework allows youth participation in works council elections from age 16. Recruitment of young people remains a priority, though growth has slowed recently due to demographic and economic factors.

The construction material supply chain

In focus: Decarbonising construction building material – steel

- **Title and main features of key decarbonisation policies:**
  - Germany's industry decarbonisation: supports (recent national industrial decarbonisation programme, €6bn announced Oct 2025 to support energy-intensive sectors including steel, with auctions/contracts to subsidize low-carbon projects)
  - National hydrogen strategy and funding: to enable direct-reduction/H_2 steel
  - Company programs: SALCOS by Salzgitter, plans for direct reduction to reach climate neutrality target ~2045).
- **Existence of collective bargaining agreements:**
  - IG Metall is the dominant union. Sector-level collective bargaining agreements exist and were actively renegotiated 2023–2025 (multi-region pilot agreements, inflation compensations, regional steel accords).

- **(Expected) impacts on the supply chain:**
  - Shift in production: the sector is moving away from blast-furnace + coke/coal primary routes toward electric-arc furnaces (EAF) using scrap, and direct reduction (DRI) using hydrogen as the reducing agent (H_2-DR).
  - Material availability and price: in the medium-term construction may face higher prices for low-carbon steel (unless strong subsidies bring costs down) and potential supply constraints while new routes scale.
  - Two simultaneous pressures: (a) climate, clear 2045 neutrality targets across the industry and public programmes; (b) competitiveness / energy costs, which are already forcing some firms (e.g. ArcelorMittal) to scale back green plans in Germany. These twin forces explain why transformation is uneven.
- **(Expected) impacts on employment, skills and activity levels of workers in the materials industry:**
  - **Job reductions** where capacity is rationalised or older blast furnaces close; conversely new jobs where green projects (DRI/H_2 plants, electrolyser factories, renewable power/turbine installation, H_2 logistics) are built. Recent restructuring plans at large firms (e.g., Thyssenkrupp) illustrate possible large, regionally-concentrated workforce impacts.
  - **Shift in occupational demand:** less demand for coal/coke handling and blast-furnace specific roles over time; more demand for electricians, automation/control engineers, process engineers, hydrogen technicians, electrolyser operators, power systems engineers, and digital/maintenance specialists.
  - **Working conditions:** H_2/ EAF processes can reduce some hazardous manual tasks (coal handling, coke ovens), dust and high-temperature manual operations, improving occupational health in certain areas. New risks (H_2 safety, high-voltage electrical maintenance), the need for stricter competence certification, and possible casualisation if parts of maintenance or services are outsourced.

- **Upskilling needs**: targeted retraining for mid-career workers (electric drives, H_2 tech, process control, safety), expansion of dual-system apprenticeships with new specialisations, and company-led/union-negotiated training funds will be required.
- **Geographic mismatch risk**: many displaced workers are in traditional steel towns; new green jobs (e.g., H_2 production hubs, electrolysis plants) may appear in different locations.

- **Country-level policies for just transition in the building material sector:**
  - Social measures are often negotiated company-by-company (works councils + IG Metall) including re-training, early retirement schemes, short-time work and negotiated social plans.
  - State aid/ownership stakes (e.g., Lower Saxony stake in Salzgitter historically): Faced with the rising carbon price trajectory under the EU Emissions Trading System (ETS), Salzgitter AG, working closely with its workforce, identified a serious threat to the plant's long-term financial sustainability. In response, the company launched the SALCOS (Salzgitter Low CO_2 Steelmaking) initiative in 2015, aiming to decarbonize its production processes and secure the future of the facility.

- No movement to other sectors seems to be happening.
- **Geographical distribution of the implications:** The steel sector is concentrated in a few cities (mostly Ruhr area), traditional steel plants may be closed there, however, there is potential for these workers to be reskilled and integrated in green steel production.

Key hotspot for transformation #1	**Key hotspot for transformation #2**
Salzgitter (Lower Saxony) / SALCOS - Salzgitter is an explicit "green-steel" focal point via SALCOS programme (H_2 and low-CO_2 steel production). This site is central to Germany's hopes for H_2-based steel and is politically sensitive (state stake, IG Metall presence). The company is emphasising job retention, and reskilling is being offered during paid working hours to ensure the existing workforce can transition into new process-operator and maintenance roles without compulsory layoffs.	ThyssenKrupp (Duisburg): announced production capacity reduction and major restructuring with potential for thousands of job cuts; negotiations with IG Metall and investors and an industrial concept are ongoing — a real-time example of decarbonisation + competitiveness pressures triggering social conflict and transformation negotiations. Although significant workforce reductions are planned, the agreement aims to avoid compulsory redundancies until 2030 and provides a social-compensation framework, while internal redeployment and early-retirement schemes are intended to soften the impact on employees.

- **Benefits for workers:** New skilled jobs (H_2 operation, plant electrification, process controls); Potential for safer/cleaner processes (less coke/coal handling); Long-term job preservation where green investment is supported.
- **Disadvantages for workers:** Short-term job losses from capacity rationalisation, outsourcing, or decommissioning of old blast furnaces; Risk of large job losses due to mismatch of climate goals and company interest (see ThyssenKrupp not wanting to transition to hydrogen); Wage pressure in restructuring; Need for large-scale retraining.
- **Existing mechanisms to protect or reinforce labour rights/conditions:** Apart from involvement of IG Metall, there is not many mechanisms protecting labour rights during the transition.

- **The role of trade unions/construction businesses:** IG Metall is central: negotiates transformation agreements, keeps pressure for apprenticeships and training budgets, and engages in company-by-company negotiations that may include training/upskilling commitments. Construction firms and customers can drive demand for green steel (creating market pull) but implementation costs (higher product prices, certification, procurement specs) will be a friction point. Unions push state aid conditioned on employment safeguards.

In focus: Decarbonising construction building material – timber

• EGGER
  ○ Production: ~9,6million m^3
  ○ Turnover: ~€4,45bn (2022/2023)
• Binderholz:
  ○ Production: ~4,5million m^3 (2024 estimate)
  ○ Turnover: ~€2,6bn (2022)
	• Number of employees per key enterprise
	  ○ EGGER
	  ▪ Workforce: 11,000
	  ○ Binderholz:
	  ▪ Workforce: 6,000
	• Relevance of enterprise in construction supply-chain:
	  ○ Construction is the largest downstream market (sawmills supply structural timber, CLT, glulam, panels. Around ~60–70% of sawnwood/wood processing output goes into construction/building and related sectors (furniture/packaging secondary).
	• Gender: 17-35% are women, depending on segment

- **Title and main features of key decarbonisation policies:** Federal "Timber construction initiative" (Holzbauinitiative, 2023): federal strategy to increase use of wood in construction (8 action fields: federal role model, R&D, skills, supply security) with ambition to raise timber construction quota by 2030; aimed at shifting building emissions away from cement/steel.

- **Existence of collective bargaining agreements for workers in the sector:** IG Metall (and regional affiliates) and sectoral employer associations negotiate tariffs for the "Holz- und Kunststoffverarbeitende Industrie" (wood & plastics manufacturing). IG Metall publishes tariff tables for wood & plastics industry; regional agreements also exist.

- **(Expected) impacts on the supply chain:** Increased demand for engineered wood (CLT, glulam, cross-lam panels) from construction policies → pressure on sawmill capacity and value-chain upgrading (investment in drying/planing/CLT facilities).

- **(Expected) impacts on employment, skills and activity levels of workers in the materials industry:** Transition to more engineered/industrialised timber construction typically shifts labour from low-skilled manual work to more skilled machine operators, CNC operators, CLT assembly technicians, designers/engineers. Net employment effect is likely to be mixed: moderate job creation in prefabrication, panel manufacturing and wood-construction, but job losses risk in commodity/trade segments if demand/price shocks persist. Working conditions / skills: Need for retraining (vocational & continuous professional development), stronger safety/automation skills, and digital/CAD/CAM competencies.

- **Country-level policies for just transition**: Holzbauinitiative also includes support for education and skilled workers.

- **Cross-sector mobility:** Workers can transfer skills from timber to construction timber-assembly and prefab manufacturing. Compared with high-emitting sectors (steel, cement), timber manufacturing

often has fewer heat-exposure and heavy-industrial hazards, but sawmills and wood processing have other risks (machinery, dust; good workplace safety reduces long-term health risks).

- **Geographical distribution of the implications:** Bavaria & Baden-Württemberg (Southern Germany) are centre of sawmill & wood products industry and are likely to see both pressures (market downturns) and growth (CLT/glulam investment). Thuringia (e.g., Pollmeier) and Mecklenburg-Vorpommern (Ilim/Wismar) are important processing/sawmill regions. Lower Saxony / North-West have forest resources and sawmills.

Key hotspot for transformation #1

- **Central Germany – Saxony, Saxony-Anhalt, Brandenburg, Thuringia (often "Mitteldeutschland")**: These states have strong forestry & wood industry employment; many smaller sawmills and wood-processing firms. There is also substantial harvesting volume (hard/softwood), and innovation potential in bioeconomy / renewable construction. Could see both risk (commodity-sawmills under pressure) and opportunity (CLT, mass timber, bio-based construction). Workers may need retraining; infrastructure (transport, energy) will matter; rural areas may benefit if supply and processing are close.

- **Benefits for workers brought by the green transition in the sector:** New job opportunities in engineered timber manufacturing, prefabrication, modular construction and associated logistics/installation. Potentially improved workplace environments vs heavy industry (less extreme heat, lower particulate/fume exposures than e.g. steel/cement), and more localised jobs in rural areas. Upskilling/reskilling opportunities and new higher-value roles (CNC, design, project management).

- **Disadvantages for workers brought by the green transition in the sector**: Short-term job losses in trading/commodity segments during market downturns; risk of consolidation (larger groups acquiring sites). Need for retraining; potential geographic mismatch between where old jobs are lost and where new green jobs appear.

- **Existing mechanisms to protect or reinforce labour rights/conditions:** Collective bargaining (IG Metall / sectoral agreements) regulates wages, working time and training provisions: these are channels for negotiated transitions (short-time work schemes, training funds). Apprenticeship / dual vocational training system: strong in Germany and a central tool for channelling workers to new skills (timber engineering, CNC, mechatronics). Federal programmes / R&D funding & regional labour market support: the Holzbauinitiative explicitly includes skills & knowledge-transfer actions; national industrial decarbonisation programmes and EU Just Transition instruments provide funding channels.

- **The role of trade unions/construction businesses:** The Hauptverband der Deutschen Holzindustrie und Kunststoffe verarbeitenden Industrie (HDH, Central Association of the German Wood and Plastics Processing Industry) works together with IG Metall (and sometimes IG BAU) to review and modernise the contents of vocational training relevant to wood, furniture, panel, and sawmill industries. Construction businesses & industry associations (e.g., HDH, GD Holz, Thünen/industry clusters) push for technical training, innovations (CLT), and R&D; costs of implementation (capital for new CLT lines, prefabrication plants) are sometimes supported by public R&D and industrial transition funds under federal initiatives.