

# BARMETAL



## Digitalization, Automatization and Decarbonization: Opportunity for Strengthening Collective Bargaining in the Metal Sector

### Sweden Policy Report

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## Introduction

The BARMETAL project aims to understand the key challenges deriving from trends of digitalization, automatization and decarbonization that influence working conditions in the metalworking sector and its companies across the EU Member States and Candidate Countries. This National report on Sweden is one of the country case studies in the BARMETAL project. It addresses RQ2 in the project, which pertains to the Swedish case: What are the main challenges/changes relevant for working conditions with respect to digitalization, automation, and decarbonization in the metalworking industry, and how can new forms of work and training related to these changes be addressed via collective bargaining?

## Methods and material

The study is based on analyses of trade journals, secondary analyses of survey data, reports, and statements by social partners in Sweden, as well as by company case studies based on interviews with representatives for the management, trade unions and employees in local manufacturing companies.

At the sectoral level, information on trade unions and employer associations was gathered from webpages and documents from the blue-collar union IF Metall, the union for engineers, Sveriges Ingenjörer (SI), the Association of Swedish Engineering Industries, Teknikföretagen, and the Confederation of Swedish Enterprise, Svenskt Näringsliv (SN). Additionally, some joint social partner organization documents were used. The document material was sufficient for the data needed and interviews were not conducted at the sectoral level.

Two company case studies and an additional company interview from a third company were used for the analysis. All in all, eleven interviews were conducted. The interviews performed with help of the joint BARMETAL interview guides took between 25 minutes and 1 hour. They were recorded and transcribed verbatim. Data was collected from the following cases and levels:

Company 1, Volvo Car Body Components, located in Olofström, employs approximately 2400 people, and produces various metal parts for Geely cars, primarily for Volvo, but also for Lynk & Co, Polestar, and Zeekr. The company's production mainly consists of pressed metal blades for car parts such as the hood, roof, and doors. The headquarters is in Gothenburg, where the car parts from Olofström are assembled at the Torslanda factory. The company has four other production sites in Sweden, and other main production plants are in China, Belgium, and the USA. The company is now investing heavily in a new factory in Kosice, Slovakia. Interviews were conducted with the Head of R&D, the union representative from the Unionen (white-collar workers), and two shop floor workers.

Company 2, Rottne Industri AB, located in Rottne, employs approximately 230 people, and has three production sites in Sweden. Its headquarters and the largest production site are both in Rottne. The company produces and assembles forest machinery such as harvesters, forwarders, harvester heads, and simulators. Interviews were conducted with the HR-manager, the Manager of Product Development, the chair of the Unionen (white-collar workers), the IF Metall union representative (blue-collar), and two shop floor workers.

Company 3, Kalmar, a part of Cargotec, located in Ljungby, employs approximately 470 people, and produces straddle carriers, lift trucks, heavy forklifts, reach stackers, and master container handlers for industrial use. Only one additional interview was conducted at Kalmar due to access limitations. The position of the interviewed person is the Head of R&D.

## 1. National and sectoral labour market situation

Sweden has a small and open economy highly dependent on its exporting industries, with many large manufacturing companies, and a rather large metal and automotive industry. According to Statistics Sweden (SCB) Around 5,6 million people out of a population of approx 10,5 million are part of the labour force, of which approximately 250 000 were unemployed in late 2023.<sup>1</sup> Around 11 % of Swedish employees are in manufacturing (incl. mining), which is close to the EU-27 mean<sup>2</sup>. The strongest subsectors in terms of value and number of employees in the manufacturing sector are for machinery and equipment, petrochemicals, and pharmaceuticals, as well as automotives and metals.<sup>3</sup> The Swedish automotive industry is still within the core of the European automotive industry, though in a weaker position after the demise of Saab and the takeover of Volvo Cars – by Ford and then by Geely (Pavlinek 2021). The automotive share of total manufacturing in Sweden is 13,8% which is the third largest share in EU 2023. Approximately 60 000 employees work directly in the sector in about 120 companies.<sup>4</sup>

## 2. Insight into industrial relations:

The Swedish industrial relations model is part of the Nordic regime of industrial relations. It is characterized by strong trade unions and employer associations that negotiate collective agreements with a high degree of autonomy from the state, and with wide bargaining coverage and relatively low levels of conflict (Baccaro and Howell 2017; Furåker and Larsson 2020; Kjellberg 2023a). Sweden has a large welfare state based on social democratic traditions. However, as in other Nordic countries, Sweden has seen the introduction of more liberal features. In the Swedish case, these liberalisations in industrial relations have been introduced particularly in the form of increased fees in unemployment insurance funds, a loosening of employment regulation (with more temporary contracts), and an organized decentralization of collective bargaining from the 1980s onwards (Prytz & Larsson forthcoming). There are, however, still also some corporatist elements in ongoing consultations with the government and authorities (Larsson & Ulfsdotter Eriksson 2019).

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<sup>1</sup> <https://www.scb.se/hitta-statistik/statistik-efter-amne/arbetsmarknad/sysselsattning-forvarvsarbete-och-arbetstider/befolkningens-arbetsmarknadsstatus/pong/statistiknyhet/befolkningens-arbetsmarknadsstatus-augusti-2023/> (accessed 15 nov 2023).

<sup>2</sup> [https://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START\\_AM\\_AM0210\\_AM0210B/ArbStDoNMNN/table/tableViewLayout1/](https://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START_AM_AM0210_AM0210B/ArbStDoNMNN/table/tableViewLayout1/) (accessed 15 nov 2023).

<sup>3</sup> <https://www.scb.se/hitta-statistik/statistik-efter-amne/naringsverksamhet/naringslivets-struktur/foretagens-ekonomi/pong/tabell-och-diagram/naringslivets-struktur/andel-av-totala-naringslivets-sni-sektion-a-s-exkl-k-och-o-foretag-anstallda-omsattning-och-foradlingsvarde-per-bransch-sni-sektioner/> (accessed 15 nov 2023).  
<https://www.scb.se/hitta-statistik/statistik-efter-amne/naringsverksamhet/naringslivets-struktur/foretagens-ekonomi/pong/tabell-och-diagram/naringslivets-struktur/andel-av-tillverkningsindustrins-sni-sektion-c-foradlingsvarde-och-antal-anstallda-per-bransch-sni-divisioner/> (accessed 15 nov 2023).

<sup>4</sup> <https://www.ibisworld.com/sweden/industry-statistics/motor-vehicle-manufacturing/1950/> (accessed 21 dec 2023).

Swedish trade unions are strong and are by tradition organized primarily on an occupational/industry basis in three class-based confederations – one each for blue-collar (LO) and white-collar workers (TCO) and one for academically trained professionals (SACO). The previously centralised collective bargaining system underwent an “organized decentralization” during the 1990s, and today’s system is characterized by (coordinated) sector level bargaining, giving quite some leeway for company level bargaining around wages and working time (Baccaro and Howell 2017; Prytz & Larsson forthcoming). Trade union representation is “single channel”, there is no statutory minimum wage, and there is no legal extension mechanism. However, Sweden has a high employer organisation density (appr. 87 % overall, while being slightly lower in the private sector with 81 %), and a high union density (appr. 70 %, while being slightly lower around 65 % in the private sector). On this basis, the collective bargaining coverage is high, around 88 %, while being somewhat lower in the private sector at 82 % (Kjellberg 2023a). In the manufacturing industries, these figures are slightly higher. 72% of the blue-collar workers and 79% of the white-collar workers are members of trade unions, and 95% of the employees are covered by collective agreements. Despite the high coverage, only 53% of all companies in the sector are covered by collective agreements, which indicates that there are many small and micro companies operating without agreements (Kjellberg 2023b).

The main social partners in the metal industry in Sweden are: The employer association Teknikföretagen (the Association of Swedish Engineering Industries, as a part of the overarching organization Svenskt Näringsliv “The Confederation of Swedish Enterprise”), with appr. 4.400 private member companies in; the blue-collar union IF Metall, with appr. 300.000 members in blue collar occupations in the metal and other manufacturing industries (IF Metall was created in 2006 through a merger of the metal workers union Metall and the manufacturing union Industrifacket); and the white-collar union Sveriges Ingenjörer (SI), with appr. 170 000 members, who mainly are engineers. The largest white-collar trade union in the private sector, including the manufacturing metal industries, is called Unionen and consists of appr. 690 000 members in some 88 000 workplaces. They have 23 regional offices that supports the representatives and local union clubs. But also not relevant workplaces have Union representatives. There are 27 000 representatives at appr. 15 000 large and small workplaces at the local level, with relatively more representatives in the larger workplaces.

### 3. D-A-D and its effects and sectoral relevance

Swedish companies were strong already in the first wave of digitalization and there has been strong political and social partner commitment during the last decade to stay ahead and competitive within the second wave of digitalization and advanced robotics, i.e., Industry 4.0 (Brodny & Tutak 2021; cf. Chari et al 2021; Johansson 2021). Similar commitments to reach a decarbonized society, including strategies for electrification of transport, industry, and society at large, also characterized the government and social partners (Brodén Gyberg & Lövbrand 2022; Gärdebo 2022).

General or sectoral collective agreements do not specifically regulate D-A-D issues, however, there are aspects of the collective agreements that are relevant. An important long-term agreement at the cross-sectoral level is the Industrial Agreement,<sup>5</sup> setting up general

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<sup>5</sup> [https://www.industriradet.se/wp-content/uploads/Industriavtalet\\_eng\\_2023-05-09.pdf](https://www.industriradet.se/wp-content/uploads/Industriavtalet_eng_2023-05-09.pdf) (English version accessed 15 nov 2023)

cooperation and negotiation principles for the manufacturing industries. This agreement sets principles for the joint partner Industrial Councils which issues statements and recommendations regarding the manufacturing sector at large, and it also stipulates a process for the bargaining rounds to secure that the exporting industries set “the mark” (ceiling) for all national bargaining, to secure international competitiveness.

At the sectoral level, there are many studies and policy statements produced by social partners, however issues concerning digitalization and new technology does not regularly translate into collective negotiation or agreements. In terms of union influence on digitalization of work, it is mainly through the codetermination process, specified by law and the cross-sectoral Development Agreement from 1985, that such issues are discussed and solved (Johansson 2021). There are some occasional general statements relating implicitly to D-A-D, such as the following from the IF Metall’s joint collective agreements with the employers concerning “Sustainable work”, under *§ 19 Measures for developing the company*, which indicates some general joint views and the ambition to solve the specifics of digital and environmental transition locally:

In the labour market, questions about work organization, skill development and salary have been discussed, against the background of both the companies' knowledge and experience of changed organization, skill development and salary formation. IF Metall has prepared a report titled, "Sustainable work". The report states that the goals set by both parties are compatible: increased productivity, profitability and development power in the companies create better conditions for the employee salary development and good working conditions in general. ... IF Metall recommends that companies, especially in connection with changes to work organization, pay attention to competence and competence development and its importance for wage systems and wage setting in the company. Its development must primarily take place in the companies. In accordance with the development agreement and the equality agreement, the company, the employees, and the trade union work together in the event of work organization changes.<sup>6</sup>

Similarly, there may exist general statements about competence development, such as the ones in *Appendix F) Competence development in the automotive industry* in the blue-collar agreement of the automotive industry:

Competence development is of decisive importance for the survival of the industry. Companies have the ultimate responsibility to ensure that its need for competence among all employees are continuously met. Planning and development meetings as well as workplace meetings can be valuable tools in this regard... If an employee requests special development planning, this must take place. Women and men must have the same opportunities for skills development. A common task for both management and employees is to bring about a continuous dialogue and active development work partly to increase the company's overall competence and partly to increase the individual's ability to face changes... The local parties must discuss and

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<sup>6</sup> IMG-avtalet 1 januari 2021–31 maj 2023. Industrifacket Metalls Gemensamma kollektivavtal, nummer 13. Detta kollektivavtal gäller för de företag som undertecknat avtalsförbindelse med Industrifacket Metall. Översatt: This collective agreement applies to companies that have signed an agreement with the Industrial Union Metall”.

should reach an agreement on the forms of collaboration in education - and other issues related to skills development.<sup>7</sup>

As for local agreements, these may concern issues such as development programmes, and in larger companies, there are often quite developed competence development programs that are used when introducing new technologies requiring staff upskilling, even if the situation may be less beneficial and organized in smaller companies. In addition, when new technology is introduced on the shopfloor, it is not always an issue for the regular trade union reps and channels – but rather something which may primarily involve the health and safety representatives (Johansson 2021).

#### 4. Sectoral relevance of DAD – responses via collective bargaining

Documents collected from social partners at the sectoral and cross-sectoral levels highlight that there is much consensus in both the employer associations Teknikföretagen and Svenskt Näringsliv and the trade unions IF Metall and Sveriges Ingenjörer in advocating for further digitalization, automation, and decarbonization to keep up with international competition and save jobs. Although Sweden is already ranked very high in terms of digitalization, automation and robotization in the manufacturing industry, social partners from both sides emphasise that further investments are needed in innovation and education/reskilling/training – not least from the government (Brodny & Tutak 2021; Ny Teknik 2021; Teknikföretagen 2022a). However, compared to the Danish case, the enthusiasm regarding the technological potential is somewhat more balanced by the discussion of the challenges and risks – particularly from the blue-collar trade union side.

The employer associations emphasize that digitalization and automation are important for both productivity and prosperity, since they increase productivity and replace monotonous tasks, while also pointing at the risk for increasing inequalities through job polarization and a loss of jobs – problems that need to be addressed through education and life-long learning (SN 2020; Teknikföretagen 2022a). Also trade unions discuss the potential and challenges, emphasising the benefits of increasing effectiveness and competitiveness by introducing automation and robotics need to be met by transitioning measures at both the national and local level. Educational and labour market policies need to be adjusted to the competence needs of industry and to counter potential job losses, while local implementation needs to be done with respect for the working environment and the need for training of staff (IF Metall 2017; cf. Johansson 2021)

What is most telling of the social partners' common views is perhaps a joint statement/opinion piece from 2021 signed by the members of the government cooperation program for the digital transformation of Swedish businesses. The previously mentioned corporatist element of the Swedish model is illustrated the fact that the members consist of representatives of employer associations (Teknikföretagen and IT&Telekomföretagen) and the trade unions (IF Metall and SI), as well as universities and some other organisations. Under

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<sup>7</sup> Motorbranschavtalet 1 december 2020 – 30 april 2023 Motorbranschens Arbetsgivareförbund - Industrifacket Metall. Cf. Collective Agreement between Teknikarbetsgivarna and Unionen, Sveriges Ingenjörer and Ledarna 1 april 2017 - 31 mars 2020; and Agreement between Tekniktjänstearbetsgivarna and Unionen/Sveriges Ingenjörer 1 April 2017 – 31 March 2020 (english translation)

the headline “Sweden will not by itself become best in the world on digitalization”, they state that the social partners, the government, and universities must cooperate to strengthen the steps and measures taken to come to grips with the digital competence deficiencies that are hampering Swedish economic growth. Given the rapid development in other countries, they believe Sweden may lose its leading position in digital technology utilization, and therefore want to see improved education and training in digital skills within the framework of lifelong learning (Ny Teknik 2021).

The topic of decarbonisation and green transition is also supported and advocated by both the employer associations and trade unions. Employer associations at both cross-sectoral and sectoral level stand behind both Swedish and EU targets on climate neutrality before 2045/2050 and believe that this may be reached while keeping Swedish export industries competitive – not least against the background that Swedish companies are already seen as being frontrunners in the decarbonization process. There is a strong emphasis that this transition is strongly related to the introduction and implementation of new technology – both the development of digitalization, automation and robotization and the education and competence development needed to implement it. Also, in these challenges there are high requirements set on national level policies and on cooperation between social partners, research and innovation, and the government (SN 2023; Teknikföretagen 2020; 2022b).

The trade unions also support the political ambitions in sustainability and decarbonization of society and industry. As the employers, they believe this is not only possible, but necessary for keeping Swedish industry competitive and sustainable. However, as on the topic of digitalization, the blue-collar union IF Metall emphasize the need to consider social justice also in relation to climate transition, so that their members are not hit by job losses and get the education/training opportunities needed to keep up with the change (IF Metall 2020; cf. Gärdebo 2022).

Also in the area of decarbonization and green transition, we find examples of the corporatist approach in an opinion piece by trade union and employer association officials who are members in the joint social partner organisation Industrins utvecklingsråd (the industry development council), voicing critique that the government has not listened to the needs of industry to create a swifter environmental assessment process, without lower the environmental requirements, in order to “create a favorable industrial climate where investments that contribute to transition/reskilling, employment, welfare, and increased environmental protection become a reality in Swedish industry” (Altinget 2022).

## 5. Case studies

All three companies studied have implemented digitalization to varying degrees, while the levels of automation and de-carbonization differ. The administrative systems of all three companies, such as finances, HR, enterprise resource planning systems (ERP systems), web shops, use digital technology. In addition, simple automation (Robotics/CNC machines) is used in production. In company #1 and #2, who produce finished products as final manufacturers or original equipment manufacturers, there is a long history of automation and a newer experience of digitalization, lately in multioperational machines.

Before the summer of 2023, company #1 gave notice of termination to 1 300 workers in Sweden, but in October only 19 employees at the studied site had lost their jobs, all within



white-collar administration. But the termination situation affected the union representative dealing with the issue during the interview.

In general, the companies have well-reasoned strategies to digitalize and automate. However, there are different rationales to consider. For instance, for company #1, there are different cost-structures in Europe and the USA compared to China that make digitalization more efficient to implement in Europe and the USA, but not in China since labour costs are still lower there. For company #2, digitalization is currently quite relevant since they started to implement a new digital enterprise resource planning system (ERP, Monitor) in June 2023. This system handles for instance access to information in the production process and thereby all employees and departments are affected.

The larger company #1 has digitalized and computerized much of the former hands-on programming of machinery and employs more advanced robots in their casting, the composition of parts and other production sequences, compared to the smaller company #2, which mainly uses simpler stand-alone robots that substitute workers for robots on a one-to-one basis. Companies #2 and #3 are aiming for more advanced digital (AI-based) automation in the future. The smaller and less digitalized company (#2) aims to rationalize and make current administrative and HR-systems more efficient by reducing the overall number of systems and integrating them with the ERP-system. Two employees have been working for the last two years solely on improving the digitalized tools for this reason. For company #1, the digitalization of the cars is crucial. Therefore, they have set up competence hubs for programming and development of digital tools. To find the adequate competences available and to keep up, those hubs are placed in different parts of the world. They also have a specific "Volvo Car Academy" that provides digital on demand and live on-site training for competence building in relation to new technology and organization of work. These trainings improve the likelihood of career development and for employees to be upskilled and promoted.

The main reasons for introducing new technologies are rather straightforward: they have to do with increasing productivity, cost efficiency and expanding businesses. The ERP systems are in general important in organizing data such as schedules, orders, documentation of ingoing production materials, monitoring production/staff performances, as well as other administrative aspects of production. But for company #2, the main goal is to simplify administrative and production processes and thereby improve quality, efficiency and to reduce faults – in general, standardise the production flow. There is also an aim to connect their Product Data Management system (PDM) with the ERP and CAD-systems to facilitate communication with, for instance, their spare parts catalogue.

The use of robots and automation is also said to increase quality and organize a more predicable production flow (in some cases functioning 24/7), and in addition, replace/release workers from monotonous tasks or reduce the demand for new employees. Similarly digital administrative systems are said to reduce the administrative workload, speed up the processes and increase documentation quality.

Digitalization processes are influenced by various factors. One of them is customer requirements, which may necessitate the use of specific technologies. Another factor is the needs and demands of suppliers and retailers on the company's requirements. The third factor is the future EU and state regulations on production and documentation. Employee



suggestions, especially from designated superusers, mainly focus on smaller improvements in the system or training content needed to adopt the systems. This is largely done by learning by doing, with the help of superusers and peers, and on-line training, rather than hiring consultants or formalizing training sessions.

However, companies face several challenges when introducing new digital and automated technologies. These include the lack of competence and need for training and retraining, especially among blue-collar workers but also among white-collar workers. Additionally, the increased transparency leads to more surveillance and control of work quality and time-efficiency, increased level of stress and frustration with slow and troublesome implementation of digital and automated tools, low levels of involvement, changing requirements for new staff, who are hard to source, and employee fear of becoming redundant are among the most common difficulties.

The impact of digitalization and automation on blue-collar workers is largely dependent on the specific roles and tasks that the workers have. While most of the implemented technologies play a relatively small part in the everyday work of the interviewed respondents, in both company #1 and # 2, there are some exceptions. For instance, some older workers who lack experience with computers and have negative attitudes towards disruptions of work routines may face more significant challenges, according to the respondents.

### 5.1. Digitalization and automation – employee and trade union involvement

Blue-collar workers who are affected by digitalization and automation require training and retraining to increase their skills in specific working tasks. While learning by doing is the most common way to acquire new skills, formal training is necessary when new technology, machines, or systems are implemented. Company #2 initially provided short 1–2-hour formal training for the new ERP-system based on the site's needs, customized to the specific tasks that each department performs, but according to the unions, the training started too late to be efficiently used. As the implementation progressed, new issues arose, and the training needed to be updated and adapted to departments or working teams. Superusers and so-called learning groups figured out solutions to the issues at hand, sometimes with the help of consultants or the company delivering the system. The training and retraining of workers in company #2 is not integrated in the general collective bargaining processes.

The employees quickly recognize problems that hinder the effective implementation of new technologies and suggest improvements either in the system itself or how to change work routines. Company #2 also has the Rottne Online system for cloud-connected vehicles working in the forests that require continuous training. They have found a way to train themselves mostly, but they also receive help from the supplier of the system. The workers are proactive in engaging themselves in training, reporting disturbances, and suggesting solutions, even if it disturbs their routines and everyday hustles.

The lack of a previous agreement and communication on these issues has resulted in an inefficient implementation process of the ERP system. However, both parties, the employer and the unions, have acknowledged the need to raise these issues for formal discussion in the future, if not in collective bargaining. This will probably help ensure that the implementation process will be more efficient and effective.

As a large multinational company, company #1 focuses on being cost-effective and flexible in their productions. Automatization and digitalization are related to these objectives when deciding where to implement which technology. In Sweden, fast, flexible production is a signum for the company and this makes them aware that individual development, training, and efficiency is crucial and to help foster the idea that automatization is necessary. Automatization and digitalization have led to great changes in the organization of work, and continue to do so, but at various levels in different departments and working teams. It takes mental stamina to become best at what you do, also when the production is constantly changing. There are great expectations for the workers to develop competencies, adapt to changing work tasks, switch between departments and working teams – sometimes several times a year – especially on those who have been working there for 30 years or more. But according to the Head of R&D, for some, the expectations are too difficult to keep up with.

The white-collar union at company #1 acknowledges the collaboration with the employer at the local level and on the national level with the management in Gothenburg. This collaboration is both formal and informal also in issues dealing with D-A-D. Recurring formal meetings concern general information, negotiations on salary and other agreements and codetermination issues, while informal discussions are used especially when there are matters of conflicts between first-level managers and employees. The level of membership in the union is 90–95% according to the respondent, and they feel great support from the workers for what the union is trying to accomplish. The on-site HR-department has reduced the service towards employees in relation to issues relating to salaries, insurances, retirement, and after the notice of termination of employment took place before the summer of 2023, the union has taken over some of the former HR-tasks together with the other unions (Ledarna, Sveriges Ingenjörer, Akademikerna and IF Metall). That is, the unions have appointed their own experts to help their members out where the HR-department is no longer in service, according to the interviewee from Unionen.

Company #1 has started to test AI and the union has been involved in all the decisions concerning digitalization and automation, for instance decisions on the investments that are done. Though, there have been instances where the company management, consisting of members from several countries, has felt that the unions are too close to decision making and have too much say in regard to some investments, such as the production of electric cars, autonomous driving, business models, and a new factory for battery production in Gothenburg.

The unions at company #1 are participating in competence building, discussing issues such as how many training hours are paid, the contents of the training and improvements in career building. The union has a vision of how work in the future will look like based on digital opportunities for white-collar workers with working from home and that there will be many new positions and working tasks while others will disappear – and the union is working in tandem with the employer to facilitate the changes necessary for workers to adapt or to be replaced by recruited staff with other competencies. But for the interviewed blue-collar workers at company #1, union activities doesn't seem to affect every day work. The workers feel that their opinions and suggestions for improvements are not always taken seriously by the management even though the union have opportunities to influence on all sorts of issues relating to working conditions and changed working tasks due to D-A-D.

The role of the unions at company #2 is to prioritize the wellbeing of their members in relation to new technology, workflow, stress, and tempo. Both white-and blue-collar union representatives seem happy with the formal meetings for negotiations as well as discussions on agreements and the informal discussions with the employer regarding D-A-D-issues. However, they lack involvement in strategic decisions related to the choice of systems, technology, and processes to implement them. While they are informed on most HR-related issues, they are not satisfied with the level of information provided on issues related to digitalization and automation, such as the ERP system. They have implemented monthly meetings with the employer which also helps with the intake of information, with the hope that it will lead to being involved before all decisions are already made.

The employer representatives at company #2 stresses the fact that the yearly employee survey brings in a lot of comments, suggestions and tips to improve the use of technology and detect frustrations in relation to D-A-D that help them adjust the processes.

Company #3 stresses that for them, digitalization mainly centers around collecting and analyzing data from the machinery to improve quality and productivity and reduce CO<sub>2</sub>-emissions, by optimizing the use of fuel, and for this, they need to recruit and train employees. The company is investing heavily on electrifying their products and making demands on their suppliers. The investments are made possible also by the support of research projects partly financed by the EU.

## 5. 2. Decarbonization in the case companies

As mentioned above, the products produced by company #2 are at work in the forests, which makes it difficult or impossible to electrify the vehicles – at least with current technology and at reasonable costs. Other larger companies in the segment have tried to use batteries as fuel for the vehicles but have not yet been successful. The production and the assembling processes are already mainly based on electricity with very few CO<sub>2</sub>-exhaustions, but the greening and effectivization of the production is on the agenda. They have so far not requested a greening of the productions or transportation from the suppliers, such as the use of electric lorries, but understand that it is something they need to eventually do.

For company #1 on the other hand, electrification is very much the focus. The company has already stopped R&D and production for diesel and petrol engines and the produced cars running on these fuels will be phased out by 2030<sup>8</sup>. More and more car models are coming into production (at least six models) and more are to come. This high ambition in sustainability is somewhat of a trademark for the company and they have transformed the production lines, the use of recycling materials, and a reorganization of the whole production system based on sustainability, an extensive change to the production processes.

On the shopfloor at company #1 the decarbonization measures that have been implemented are not severely affecting the work processes or the working conditions. One of the workers interviewed is a forklift driver for logistics: his job is to deliver the right components in the right quantity at the right time to assembly lines. He mentions that his job has not changed

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<sup>8</sup> Volvo Cars, Global Newsroom <https://www.media.volvocars.com/global/en-gb/media/pressreleases/317640/volvo-cars-declares-the-end-of-diesel-at-climate-week-nyc-our-last-diesel-car-will-be-produced-in-ea> (accessed 27 Feb. 2024).

due to the electrification of the produced cars, but that the work process has changed somewhat due to the implementation of a digital scanner that is used to ensure everything runs smoothly. Otherwise, his work has sped up and some operations have been added to his tasks.

One interviewee at company #1 works on the “scrap press” taking care of metal scraps. For him, decarbonization doesn’t mean any changes in work or training since the cars are still made from metal, but investments in a new metal press that is automated makes work a bit easier. This investment is a part of the whole company adjusting to reduce CO2 emissions and to decarbonize production. Another important change in production is to reduce the electricity used for compressed air processes used for driving some machines and to be exchanged by more efficient electronically controlled processes, all powered by electricity from renewable sources such as hydropower and wind power. In their aim for becoming circular (reusing, recycling, and repairing materials), their focus is on using less material and reducing the weight of the cars – and this includes demands on all their suppliers to contribute to this as well.

The main reasons for introducing decarbonization measures, based on the interviews, are based both on internal business model logics and external pressures mainly from external competition and customers and state demands – for instance via taxes such as the bonus malus systems, CO2 taxation and public investments in charging stations.

## 6. Findings

To sum up, Sweden is a small open economy that is heavily dependent on exports. The metal production and vehicle industry are significant contributors to the country’s exports. Sweden has strong political and social partner commitments to stay ahead and be competitive in all kinds of digitalization, automation, and decarbonization.

Approximately 11% of Swedish employees work in the manufacturing sector, with the strongest sub-sectors being the manufacture of machinery and equipment, petrochemicals, pharmaceuticals, automotives, and metals. The Swedish automotive industry is at the core of the European automotive industry.

Sweden has a high employer organization density of approximately 87% overall. However, this number is slightly lower in the private sector, with 81%. The country also has a high union density of approximately 70%, which is slightly lower around 65% in the private sector. Based on these numbers, collective bargaining coverage is high, around 88%, while being somewhat lower in the private sector, at 82%.

In the manufacturing industries, 72% of blue-collar workers and 79% of white-collar workers are members of trade unions. Furthermore, 95% of employees are covered by collective agreements. Despite the high coverage, only 53% of all companies in the sector are covered by collective agreements.

General or sectoral collective agreements do not specifically regulate D-A-D issues. However, there are aspects of the CAs that are of relevance. An important long-term agreement at cross-sectoral level is the Industrial Agreement, which sets up general cooperation and

negotiation principles for the manufacturing industries. Issues of competence building and sustainable work in relation to transforming organizations based on digitalization are currently discussed on all levels, from national to local levels, sometimes resulting in local bargaining and negotiations.

All three companies studied have strategies to digitalize and automate but have only partly been negotiated with the unions. Local trade union representatives are said to have rather little influence on implementation. Still, representatives of the companies maintain that blue- and white-collar worker interests are taken into consideration, and that their views matter. In all companies, opportunities are secured through a joint trade union-management consultation process. However, according to union representatives, they are sometimes consulted too late in the process. The unions seem to agree on the issues at hand, whether they concern safety, change of work tasks, job rotation or competence building. However, not all workers are affected yet by the changes, and those who cannot live up to the demands may be offered programs for early retirement or help finding another job as they will need to be replaced.

The degree of automation varies among the three companies. Company #1 is mainly focused on decarbonization, while company #2 produces vehicles for which no technological solutions are yet available for electrification. Digitalization and automatization are a priority for all three companies. The reasons for introducing DAD technology are straightforward: to increase productivity and quality, keep up with competition, and be cost-efficient. Automation and ERP are also used to organize the production flow, increase the tempo, and control work. Sometimes, technology can replace the lack of competence, reducing the need for workers.

The main reasons for decarbonization seem to come from external pressures, but also from adapted business models from owners and the internal management. D-A-D technologies are also being requested by customers, suppliers, and political regulations. In addition, bottom-up improvements may also be suggested by employees. All in all, the DAD issues are very much framed in terms of staying competitive internationally.

The main local difficulties with D-A-D-technologies are to facilitate a swift and smooth implementation. Employee competences and attitudes may be obstacles, and it may be difficult to attract and develop the competences needed. Further education and training of staff exists in all three studied companies.

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