

A Just Transition to an Electric Vehicle Production System. Are We Ready? Jobs, Skills and Qualifications.

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In this blog I report on our project on a “just transition^{[\[i\]](#)” to electric vehicles in the automotive sector (with Alex de Ruyter, Sally Weller, Ian Henry, Al Rainnie, and Beverley Nielsen) that was funded by the British Academy, and the implications for the West Midlands. The focus here is on what skills mix is needed and where skills gaps are, and what the role of government should be to facilitate the transition.}

Job loss

The development of an EV production system to meet net zero targets by 2030 is going to see a huge shift in skills requirements for the industry, from one being based on Metals/Mechanics to one based on Electrics/Electronics.

The transition will lead to job loss in the operative production of vehicles and parts in the ICE production system that could amount to the order of between 10% and 30% of jobs, depending on whether we want to be optimistic or pessimistic about the transition.

This includes jobs in adjunct supporting and executive task occupations. Jobs will be lost in supply chain coordination, the coordination of production, and even machinery supervisor jobs, as well as those of Project Manager and Production Planner.

The seismic shift in production systems, the outcome of electrification and digitisation will, on the other hand, see a huge increase in demand for data analysts (250%-350%) and software developers (5% to 30%) as well as Electrotechnical workers (a 10% increase).

Skills requirements and Qualifications

Workers in EV production will need to have a basic knowledge of electric vehicles and to have skills in the installation of interior components and the laying of cable harnesses, skills in the handling of high voltage systems and the ability to work with high-voltage components and in the handling of chemicals and hazardous materials, as well as skills in the operation and servicing of machines for the production of electrodes. Production workers would principally be trained on the job, but would be required to take a specialist course in Advanced Manufacturing Engineering.^{[\[ii\]](#)}

Skills for the production of lithium-ion batteries involves working with high voltage components, as well as the operation and servicing of machines for the production of electrodes and quality management for electrochemical energy storage. This all requires degree level qualifications. Systems Engineers, Database Development Engineers and Thermal Management Engineers will require the highest level of academic qualifications (a PhD).

Increasingly, knowledge of electrics, electronics, and IT is required as is training in networking, data management, and process planning. Auto industry workers, and engineers in particular, will need to have software and digital skills. Moreover, workers who can think and act in an interdisciplinary manner are needed^{[\[iii\]](#)}.

Plans by VW, to develop a Digital Production Platform^{[\[iv\]](#)} at Group level, in which data from machines, plants and system are bought together with finance and procurement, to streamline the production system, from the order through to the sale of a vehicle. This digitisation (Industry 4.0^{[\[v\]](#)})

in Production Engineering, is having an impact on working methods in production as well as in administration and management functions (e.g. Agile Development) This emphasises again the need for software and digital skills.

Are we ready for the transition?

The findings from our study suggest that we are not yet ready in the West Midlands to meet skills and qualification challenges posed by the transition to an electric vehicle production system. Interviewees in our study recognise skills issues:

“...there’s niche skills which exist which were going to need more of. One of the ones we come across quite often is around power electronics. There isn’t enough power electronics experience or skill at the moment, that’s a really short supply” (Interview 10).

“we got people with quite strong electrical skills, not necessarily totally allied to appropriate motors but I think we could do some training in that area (Interview 3).

However, the survey of workers, carried out as part of our study of the West Midlands, revealed that:

- 11.7% held a Bachelor’s degree or equivalent and 4.1% had a Postgraduate degree or equivalent. This is lower than would be expected in an electric vehicle production system. 52.7% had a technical or trade qualification.
- They had not been offered any training or upskilling by their employer to help them prepare for the transition (85%).
- They were not undertaking training under their own volition (90%)

However,

- They thought their skills had a “good overlap” with the skills needed to manufacture low-carbon vehicles (32.4%);
- On the other hand, 20.3% thought their skills had “little” or “no overlap”.
- At the same time, they would consider retraining for a new job role in the zero-carbon economy (68%).

While we know that training is being undertaken by Nissan, Toyota, BMW and VW, our findings suggest that more needs to be done. We also need to be aware that as the EV production system develops, new jobs and new skills will arise that require the design of new qualifications.

We also need to be aware that firms in the ICE vehicle production system that are unable to adapt to production of components for electric vehicles will close and redundancies will ensue.

What about redundant workers?

The Australian part of the study showed that an extensive programme of support was available to workers to retrain when their automotive industry firms closed and in the wake of the lack of success in developing an electric vehicle production system in South Australia. It is similar to the programme of support that was developed to help MG Rover workers when the Longbridge factory closed in 2005^[vi].

Volkswagen is way ahead in securing a just transition for its employees, insofar as it has agreed to secure all jobs to 2029. It has also said it will diversify into other sectors of industry and train workers to work in jobs in new businesses. For those who cannot be redeployed, VW is offering retirement and partial retirement with generous redundancy packages. Perhaps more importantly, it has said that it will guide employees through the transition. We recommend that the UK government establish a Skills Taskforce to commission research and intelligence gathering on skills requirements and skills shortages to enable the design of training and degree programmes that will meet skills requirements; that it provides funding for training provision; and that VMs and supply chain firms work together on skills requirements so that supply chain firms are integrated into the training programmes of VMs, which is essential to ensure the coordination of skills training in order to achieve competitiveness and a just transition to the emerging EV production system

^[ii] A 'just transition' can be defined as "securing the future and livelihoods of workers and their communities in the transition to a low-carbon economy. It is based on social dialogue between workers and their unions, employers, and government, and consultation with communities and civil society" (Emden, J., Murphy, L. and Kelleher, M. (2021) COP 26: A just transition? Workshop summary. London: IPPR.).

^[iii] Faraday (2020) 'UK Electric Vehicle and Battery Production Potential to 2040' Annual Gigafactory Study. Didcot: The Faraday Institution.

^[iii] Herrmann, Florian ; Beinhauer, Wolfgang ; Borrmann, Daniel ; Potinecke, Thomas; Praeg, Claus-Peter; Rally, Peter (2020) 'Employment 2030: Effects of electromobility and digitization on the quality and quantity of employment at Volkswagen; final report. Summary and Key Findings'. Stuttgart: Fraunhofer IAO https://publica.fraunhofer.de/eprints/urn_nbn_de_0011-n-6154803.pdf (last accessed 14/02/2022).

^[iv] Making it a tech company – Elon Musk's idea.

^[v] De Propris, L. and Bailey, D. (2021), 'Pathways of regional transformation and Industry 4.0', *Regional Studies*, 55(10-11), pp. 1617-1629.

^[vi] Bailey, D., Chapain, C., Mahdon, M. and Fauth, R. (2008), 'Life after Longbridge: Three Years on. Pathways to Re-employment in a Restructuring Economy'. London: The Work Foundation.