

Modeling the labor demand of the construction industry with regard to the implementation of the green transformation in Germany.

Topic: Dynamic Modelling of Economic Impacts of GHG Reductions

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With the "Fit for 55 Package", the EU Commission sets the target of reducing the European Union's greenhouse gas emissions by 55 percent by 2030 in order to meet the targets of the Paris Agreement on Climate Change. In Germany, the targets are specified by the Climate Protection Act. This provides for a reduction of CO₂ emissions by 65% by 2030 compared with 1990 levels, and in 2045 Germany is to achieve greenhouse gas neutrality, i.e. there is to be a balance between greenhouse gas emissions and their reduction. In order to achieve the overall goal of emission savings, the Climate Protection Act provides a monitoring system for the energy-, industrial-, transport-, buildings- and agriculture sector.

The targets for the buildings sector are ambitious. The sector already showed an excess of 2 million metric tons of CO₂ for 2021 compared with the permitted level of 113 million metric tons of CO₂ equivalents. As a result, the relevant ministries submitted an emergency program to ensure compliance with the sector's annual emission levels for the following years. The emergency program assumes, that the medium- and long-term climate targets in the buildings sector only can be achieved if there is a rapid and significant increase in the pace of renovation, including both an increase in the rate and depth of renovation, and if the heat supply is decarbonized at the same time. In concrete terms, this means implementing or promoting measures in the areas of renovation and insulation of existing buildings, promotion of new methods such as serial renovation, optimization of existing heating systems and increased installation of heat pumps.

All the measures mentioned in the emergency program require a large number of additional qualified workers from professions in the construction industry (Helmrich et al. 2021), an industry in which 58% (DIHK 2023) of companies already complain about shortages of skilled workers. It is therefore of central interest to political decision-makers to know the future medium- and long-term demand for employees in the construction sector, broken down as deeply as possible by economic sector, in order to incorporate this knowledge into education policy decisions, to counteract the shortage of skilled workers and to make the green transformation a success.

This study addresses the above-mentioned question with a long-term forecast of the labor demand in the German construction sector until 2050. The labor demand of the construction sector is differentiated down to the 2-digit level of the classification of economic activities (WZ-2008). This is of particular importance because the implementation of the green transformation, i.e., more energy-efficient refurbishment and optimization of heating systems, will primarily require skilled workers in the finishing trades (WZ-43) and less in building construction (WZ-41) or civil engineering (WZ-42).

The future labor demand of the construction sector is modelled within the new "Construction module" of the Q-INFORGE model. This is an extension of the INFORUM-Model INFORGE (Ahlert et al. 2009, Becker et al. 2022) (INterindustry FORecasting Germany) of the Institute of Economic Structures Research (GWS www.gws-os.com, Germany Osnabrück). Q-INFORGE is developed together with the Institute for Employment Research in Nürnberg (IAB) and the Federal Institute for Vocational Education and Training in Bonn (BIBB). Q stands for the QuBe-project - qualifications and occupations in the future (www.qube-projekt.de). The QuBe-project has been working together since 2007 and, among other things, produces the skilled labour monitoring for the Federal Ministry of Labour and Social Affairs in Germany since 2016. The standard Q-INFORGE

model is based on the system of national accounts and uses the IO-Tables to project eg. production, labour demand and professions. Each economic sector is modelled in detail. Final and intermediate demand, unit costs and prices have impact on the specific production and the employment of 63 economic sectors. The behavioural equations are econometrically estimated using data from 1991 to 2022. The model runs year by year from 2023 until 2050. For this study, the new 'construction module' is used, which expands the Q-INFORGE model and makes it possible to split what was previously considered the construction industry into building construction (WZ-41) civil engineering (WZ-42) and finishing trades (WZ-43).

In the presentation, the modelling of labor demand within the 'construction module' is discussed in detail and the empirical results of the forecast of labor demand until 2050 for building construction (WZ-41), civil engineering (WZ-42) and finishing trades (WZ-43) are presented.