

Classification of industrial sectors from an energy perspective

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Abstract:

The industry sector is one of the main energy consumers in a country. In line with the European Green Deal different European countries are currently developing strategies to reach net zero emissions by 2050 or earlier. However, the diversity of industrial processes and energy demands complicates the development of generalised concepts for the decarbonisation of the industrial sector and its subsectors. Industry classifications typically cluster based on products or into subsectors by economic activities. An alternative would be to group industries according to their energy demands and processes. The largest share of energy demand in industry goes into process heat. Process heat refers to heat that is necessary for thermal processes such as drying or melting. It can be divided into different temperature levels, similar processes or applied technologies. By looking at this heat demand, overlaps can be found between industry sectors with different products and processes. This scientific work therefore deals with the reclassification of industrial sectors from an energy perspective as a basis for an industrial decarbonisation concept development.

To realise the aforementioned reclassification of the industry sector, all industrial sectors (manufacturing) are examined, and the respective processes are summarised. For this purpose, data on consumption is collected from statistical offices or industry-related associations. Furthermore, the individual processes of the sectors are broken down and analysed technically. The corresponding data sets flow into an overview from which similarities and overlaps of different processes and industries can be identified. For example, similar temperatures are used for bleaching in the textile, leather, and paper industries.

Many synergies were identified in industry sectors that share processes at similar temperature levels with other sectors. But further research is needed on additional technological overlaps and product-specific requirements (e.g., on the heat transfer medium) to create an ideal bottom-up classification for energy concept development.

Keywords:

Classification; Decarbonisation; Industrial processes; Net zero 2050; Process heat.