

Multisectoral analyses of industrial water use in Scotland: decomposition analyses, linkage measures and their policy relevance

Topic: Thematic IO analysis: Energy and Environment

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There is an extensive literature on linkages between economic activity and water use, for instance in the production of water footprints, and virtual water. In some countries, a relatively water abundant climate offers the possibility to develop water-resources for economic development, an opportunity to which policymakers are alert, including through the objectives of the devolved Scottish Government's Hydro Nation Strategy. Such fundamental questions about the relationship between regional water use and economic activity have not previously been explored empirically through multisectoral analysis, partly due to a lack of data on water use at the sectoral level at a sub-national level level.

Our paper takes a novel dataset on Scottish premise-level industrial water consumption, connects these to publicly available Input-Output tables, and permits a unique perspective on direct and indirect industrial water use in a developed water-abundant region. Analysing this dataset through conventional (single-region) multisectoral modelling approaches – including Industrial Decomposition Analysis (IDA), Structural Decomposition Analysis (SDA), and linkage measures – we examine water use in the Scottish economy between 2012 and 2016.

In our results to date, we can identify the role played by improvements in sectoral water intensities in driving aggregate water consumption; the apparent complementarity between low carbon energy policy and water use through technology choices in the electricity sector; and changes in the spatial and sectoral pattern of industrial water consumption. Our findings have implications for a range of industry and policy actors in Scotland, including stakeholders in the water technology, policy and environmental areas.