Value Chain Structures that Define European Cellulosic Ethanol Production

Production of cellulosic ethanol (CE) has not yet reached the scale envisaged by the literature and industry. This study explores CE production in Europe to improve understanding of the motivations and barriers associated with this situation. To do this, we conduct a case study-based analysis of CE production plants across Europe from a global value chain (GVC) perspective. We find that most CE production plants in the EU focus largely on intellectual property and are therefore only at the pilot or demonstration scale. Crescentino, the largest CE production facility in Europe, is also more interested in technology licensing than producing ethanol. Demonstration-scale plants tend to have a larger variety of feedstocks, whereas forestry-based plants have more diversity of outputs. As scale increases, the diversity of feedstocks and outputs diminishes, and firms struggle with feedstock provisioning, global petroleum markets and higher financial risks. We argue that, to increase CE production, policies should consider value chains, promote the wider bio-economy of products and focus on economies of scope. Whereas the EU and its member states have ethanol quotas and blending targets, a more effective policy would be to seek to reduce the risks involved in financing capital projects, secure feedstock provisioning and support a diversity of end products.