The desire to have a more sustainable future, with lower emissions of carbon and sulfur to the atmosphere, a more appropriate reuse and valorization of wastes, and less dependency on oil has motivated the society to develop processes where renewable biomass is used as a feedstock for the production of fuels, chemicals, energy and materials. In addition, a bio-based economy has also potential to generate new jobs and new opportunities for entrepreneurship, with further benefits to the society. In view of this, great efforts have been done in order to develop efficient, sustainable and cost competitive bio-based processes able to be implemented in industrial scale. Although important advances were achieved and some processes are already available in a large scale, improvements are still needed to have a final product at a more competitive market price. In this sense, the strategy of integrating biorefineries to produce a variety of products from biomass has been considered as an important alternative to improve the financial performance. This paper highlights the most recent advances and opportunities in biomass conversion technologies and biorefineries for the development of a bio-based economy. Technological aspects including the hemicellulose integration and use of sugars for different products, lignin valorization, development of efficient and low-cost pretreatment technologies and development of highly efficient fermentation processes are also presented and discussed.