

## **Andrés Anca-Couce**

- Position and affiliation

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- Title:

### **Technological developments and modelling of biomass thermo-chemical conversion in bioenergy and biorefinery concepts**

- Brief summary

Recent advances are presented on thermo-chemical biomass conversion and its integration into renewable bioenergy and biorefinery concepts. Several processes based on combustion, gasification and pyrolysis of biomass were developed in recent years for the production of bioheat, bioelectricity, biofuels and biochemicals, tackling the current main barriers for increasing the use of biomass. Relevant examples are modern biomass boilers with minimal emissions, micro-gasifiers for traditional biomass utilization with low emissions and the production of electricity with high efficiencies and second-generation biofuels with concepts based on gasification. The advances are supported by the application of multi-scale models, considering the molecular, particle and reactor level. The presented modelling approach includes detailed reaction mechanisms, as the RAC pyrolysis scheme, together with a CFD modelling of the reactors considering the conversion and movement of biomass particles.