

## RES cooperation

The aim of the particular Special Issue is to provide information and a comprehensive analysis of the technical, socio-economic and environmental aspects of Renewable Energy Sources (RES) cooperation, investigating how Europe will meet the 2020 RES targets and fully decarbonise its energy system in the long term. The motivation of this effort originated from the Intelligent Energy Europe (IEE) project: “*Bringing Europe and Third countries closer together through renewable Energies*” (BETTER), whose main purpose was to assess, through case studies, stakeholders involvement and integrated analysis to what extent RES cooperation (as defined in Article 9 of RES Directive 2009/28/EC) among European Union (EU) Member States (MSs) and neighbouring countries can help Europe achieve its RES targets in 2020 and beyond.

In this Special Issue, nine high-quality articles were selected aligning latest practices, innovation and case studies with academic frameworks and theories, exploring critical parameters of the complex issue of the implementation of cooperation among Europe and its neighbours in the field of RES generation and expansion. Each paper illuminates one or more of the critical issues regarding the implementation of joint RES projects and RES deployment in EU for RES targets to be successfully reached in a 2020 timeframe and beyond.

The Issue opens with the article of Johan Lilliestam *et al.*, which tries to investigate the factors explaining the MSs weak interest in renewable electricity imports, despite the apparent potential cost attractiveness, including the views and needs of different types of actors at all levels, from the highest political level to the individual citizen level. The paper also identifies the determinants of success or failure of RES imports to the EU from non-EU countries as regulated by Article 9 of RES Directive.

Andreas Beneking *et al.* continue applying a strength, weakness, opportunities and threats (SWOT) method to the case of possible RES electricity joint projects under the Article 9 RES Directive between MS and North Africa region. The SWOT analysis follows a three tier structure examining macro, micro and acceptance issues, whereas the results are based on an intense stakeholders consultation process.

The third chapter is written by Charikleia Karakosta *et al.* exploring Turkey’s current energy status with a focus on RES cooperation mechanisms within the framework of RES Directive. The study uses the SWOT analysis providing a clearer view of expanding RES in Turkey, as well as the level of utilization and potential of cooperation mechanisms and renewable energy in the country. The approach followed incorporates desktop analysis, stakeholders’ mapping and involvement, key factors’ identification and results analysis and validation.

Charikleia Karakosta *et al.* investigate the current energy status in the Western Balkan countries and the related perspectives for RES cooperation mechanisms though the elaboration of a SWOT analysis, laying particular emphasis on the case of Bosnia-Herzegovina, Croatia and Serbia. To this end, the main challenges to expand RES as starting point for exporting electricity are assessed with a country-by-country assessment of challenges while the cooperation opportunities and future energy pathways are investigated.

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Emma Hakala *et al.* continue and carry out an analysis of sustainability and leapfrogging in the energy transition in Serbia. This article relies on quantitative data on sustainable energy indicators. The sustainable energy indicators, as well as policy analysis of key sector documents, will be used to identify the barriers that are locking Serbia into a path of large-scale projects that maintain unsustainable production and worsen energy poverty rather than helping the transition towards sustainability.

Aikaterini Papapostolou *et al.* assess the country risk to support bilateral cooperation for RES electricity generation projects in North Africa region. A multi-criteria decision support methodology is developed taking into account three evaluation parameters, namely, the investment framework, the social conditions and the energy and technological status. The proposed methodology has been applied to five North Africa countries so as to draw key results indicating how conducive the environment of each North Africa country is with regards to hosting a RES project under the umbrella of cooperation mechanism.

In the next paper, Marijke Welisch *et al.* undertake a quantitative assessment on the extent to which RES cooperation can create mutual benefits, identifying costs and benefits for both sides (EU and neighbouring countries) but in particular with respect to RES target achievement at EU level, with a specific focus at 2030. The potentials for RES generation in Turkey, North Africa and the Western Balkans are calculated under different policy pathways, taking into account different levels of economic and non-economic barriers. The overarching integrated assessment provides policy implications for future cooperation between the EU28 MSs and their neighbouring countries.

Franz Trieb *et al.* investigate the concept of solar electricity transfer from North Africa to Europe. The current background and the main barriers for RES electricity exports from North Africa to Europe are identified, whereas a potential business case for RES electricity transfers on the basis of a rigorous selection of win-win options for both regions is presented. From the findings of the North Africa case study, a number of recommendations are extracted for possible RES electricity cooperation between North Africa and Europe in the frame of Article 9 or a similar mechanism that could be implemented after 2020.

Åsa Tvetan *et al.* analyse the effects of increased integration between thermal and hydropower-dominated power systems on variable renewable energy (VRE) sources integration. A theoretical introduction to the market value of VRE and the effect of thermal-hydro interconnection is provided, followed by analysis with a high-resolution, comprehensive power market model for the Northern European power system.

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As Editors of this Special Issue, we do hope that it will contribute to realizing the necessity of RES cooperation among European and its neighbouring countries to meet the 2020 and beyond RES target.

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