The development of a sustainable and efficient energy system is one of the biggest challenges of the European Union. The European Commission has recently published actions set out to reach the ambitious vision of becoming a resilient Energy Union that addresses sustainability, energy security and competitiveness (EC, 2015a; 2015b). In order to achieve these goals, fundamental changes to Europe’s energy systems are required. Renewable energies can contribute to these goals by reducing fossil fuel dependency and greenhouse gas emissions while guaranteeing a more secure supply (IPCC, 2011). Solar energy is considered to be environmentally and socio-economically beneficial if properly
designed, planned and managed, and also enjoys favourable public acceptance (Turney, 2011; Tsoutsos, 2005; Tsantopoulos et al., 2014).

The European Union, through its cohesion and structural funds, helps regions invest in renewable energy. In the programming period 2007-2013 a total of €1 071 million were allocated to solar energy investments across the EU’s regions. At the request of the Directorate-General for Regional and Urban Policy – which at the time was evaluating the results of the Regional policy in the context of the 6th report on economic, social and territorial cohesion (EC, 2015) – the JRC (LUISA, 2014) conducted an assessment of the regional suitability for solar power plants and the regional allocation of funds towards the development of solar energy systems. The study produced a European suitability map for large-scale photovoltaic (PV) power plants, which considers factors such as solar radiation, distance to urban areas, topography, land use/cover constraints, and proximity to the electrical grid and road network. EU regional investment in the development of solar energy systems was then compared to the regional suitability map for PV systems, revealing an absence of correlation between the two. In fact, only a few regions, typically in southern Europe, scored high in terms of both suitability and EU investment levels. Conversely, most of the regions that scored high suitability enjoyed low investment levels, while other regions with low to moderate suitability had significant EU investment. The allocation of EU resources by Member States to projects developing solar energy has therefore been governed by criteria other than regional suitability.
The results of this study thus highlight the need to consider regional suitability for solar energy in order to optimise the allocation and the effectiveness of EU funds towards the exploitation of this energy source. It is also argued that marginal lands in Europe should be primarily chosen to locate large-scale PV power plants in order to avoid competition for land with agriculture and detrimental landscape and environmental consequences. This assessment further enriches the Land-Use based Integrated Sustainability Assessment (LUISA) modelling platform [3], which aims to assess the territorial impacts of EU policies and investment.

Further information

An assessment of the regional potential for solar power generation in EU-28 [4]