



A System of Systems (SoS) Approach to Sustainable Energy Planning in MENA

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The global issue of climate change has put pressure on governments to de-carbonise their energy portfolios by transitioning from the dominant use of fossil fuels energy to extensive use of renewable energies. The lack of renewable energy laws and credible targets and valid roadmaps for energy policies within the MENA region has led to ambitious and unrealistic renewable targets, where countries such as Djibouti and Morocco are aiming for 100% and 42% renewables respectively, by 2020, while Kuwait and Qatar are only aiming for 5% and 6% respectively. Nevertheless, this demonstrates the commitment and desirability of the members of the MENA region on increasing their share of renewables in their energy mix to reduce the greenhouse gas emissions of the region and minimise the unintended impacts of energy technologies on major natural resources through use of cost efficient technologies.

The Relative Aggregate Footprint (RAF) of energy sources among the member states of the MENA region is assessed by applying the “System of Systems (SoS) Approach to Energy Sustainability Assessment” (Hadian and Madani, 2015). RAF demonstrates the efficiency of the overall resource-use of energy resources through creating a trade-off between carbon footprint, land footprint, water footprint, and economic cost. Using the resource availability of each member states, weights are assigned to the four criteria. This allows the evaluation of the desirability of energy sources with respect to regional resource availability and therefore, the efficiency of the overall resource-use of the energy portfolio of the MENA region is determined.

This study has recognised the need for reform and radical changes within the MENA region’s energy profile to make a significant contribution to the reduction of carbon emissions in order to use the resources in a sustainable way and increase the regional energy security of the member states across MENA.

Reference:

Hadian S, Madani K (2015) A System of Systems Approach to Energy Sustainability Assessment: Are All Renewables Really Green? *Ecological Indicators*, 52, 194–206.