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## Employment from renewable energy and energy efficiency in Tunisia – new insights, new results

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### Abstract

The MENA region is facing economic and social challenges such as creating job opportunities especially for the youth. It also exhibits vast potential for renewable energy and energy efficiency (RE&EE) and tapping this potential can create economic benefits and jobs. This paper analyses the economic impacts of RE&EE support for Tunisia. In Tunisia, RE&EE legislation is in force since 2009 with the Tunisian Solar Plan (PST). For the economic impact analysis of the PST, a team of German and Tunisian researchers developed an economic model based on Tunisian statistical data and in sync with the methodology suggested by international agencies such as IRENA or IEA-RETD. The approach is based on Input-Output-Analysis, which allows for an analysis of impacts in different sectors e.g. machinery, metal industry etc. The paper will present the methodology and give an outlook on new results from an ongoing update.

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### 1. Introduction

Strategies to increase the contribution of renewables to the energy supply and to enhance energy efficiency of industries and households belong to the agenda of many countries. The motifs are manifold: governments wish to

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decrease energy dependence and increase energy security, to improve access to energy and to contribute to the mitigation of climate change. Utilities wish to improve energy supply and billing efficiency. Enterprises see new areas of activities and opportunities for business. Overall, there is increasing evidence that the support of new technologies will accelerate industrial development and support economic growth and competitiveness. Moreover, from literature ([1], [2]) it is clear how, given the respective policy support<sup>1</sup>, renewable energy and energy efficiency may entail positive effects on the labour market, on qualification and innovation.

However, most research on the subject has been carried out for industrialized countries. Early examples include 0 for the US, 0, [5], [6] for Germany or 0, [8] for the EU 27, in addition to the Greenpeace Energy [R]evolution studies. Developing countries often fear that they have to import expensive technologies and the benefits stay with the industrialized countries who produce these technologies. If own industrial production exists in a developing country, the effects are similar – or even better – than for industrial countries. The International Agency for Renewable Energy (IRENA) launched several studies on these issues, other institutions and regulatory authorities followed [9].

The modelling approach recommended by international bodies for this type of analysis is challenging in terms of knowledge and data. IEA-RETD recommends to base analyses on the economic Input-Output Approach 0. The strength of this approach is that it measures direct and indirect jobs. Direct jobs are created in the production industries, which produce the PV modules, the wind generators or the solar water heaters. Indirect jobs occur in the respective industries which produce the materials needed for the production or the services needed for the design, the installation or the construction of the technologies. Both direct and indirect jobs are subsumed under the headline “gross employment”, and give an estimate of the overall economic effect of additional investment in renewables and energy efficiency.

Modelling these effects for developing countries creates new challenges in terms of data availability, suitability of models and the choice of the overall approach. The country studied in the following is Tunisia. In Tunisia, RE&EE legislation is in force since 2009 with the Tunisian Solar Plan (PST)[11]. Therefore, legislation to support the energy transitions towards green technologies and to decrease electricity consumption has been in place for quite some time. In addition, World Bank together with Tunisian researchers and stakeholders developed a support scheme called Program Solaire (PROSOL) which promotes solar water heaters (SWH). The solar water heaters eligible for promotion are built in Tunisia, thus creating local value and local jobs.

Tunisia has the statistical data for an economic approach called Input-Output-Analysis (IO Analysis), since the so-called IO-tables are provided by the Statistical Bureau of Tunisia (see method section below). Detailed data on the energy system and on the success of the PROSOL scheme were collected by the Tunisian research partners from the company Alcor and with support from ANME, the regulatory authority in the electricity sector. The ex-post analysis shows that jobs have been created in particular in the SWH sector and by increasing energy efficiency in buildings. For the future, different scenarios were developed by the German Wuppertal Institute, together with Alcor 0. These scenarios in physical units (Megawatt, MW) were translated into investment paths and direct and indirect employment was estimated along these paths. Knowledge about global employment factors and cost structures in the production of renewable energy systems was contributed by the German partner (for details see 0). The results are promising in two ways: firstly, the method developed for industrialized countries / OECD countries has been applied successfully in a developing country/ emerging economy and secondly the results show that additional investment in renewable energy and energy efficiency creates jobs across all economic sectors. Sensitivities with different local content requirements are included in the analysis. The presentation will give an overview of the method, the results and latest development in the RE&EE sector in Tunisia.

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<sup>1</sup> The policy mix should contain instruments which stringently set consistent targets for RE and EE. A target for the shares of renewables in a particular year depends crucially on total energy demand and thus on the target for energy efficiency.

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