

A SOCIOECONOMICAL WIND ENERGY APPROACH IN EGYPT, UTILIZING TAILWINDS FROM A FAST-MOVING EUROPEAN ENERGY ECONOMY

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Introduction

Egypt's energy economy is in transition. In the midst of an economic crisis following a devaluation of the currency about 50 % over night at the end of 2016, and inflation rates exceeding 30 %, fuel prices and electricity rates are highly affected by this devaluation and even strengthen the governmental strategy to cut off the omnipresent energy awareness opponent, "Subsidized fossil fuels". The last price increase happened during summer 2017, where e.g. Diesel price raised about 55 %. [1]

Egyptian electricity market

Nearly 99 % of Egypt's population have access to electricity, which is mostly dependent on fossil fuels. Natural gas and other conventional fuels have always been considered the most dominant sources for electricity generation in Egypt and will be for many years to come. In addition to hydropower and non-commercial fuels like biomass, they represent the bulk of energy resources in Egypt. The share of renewables is remarkably low as it is still below 2.5 % in terms of totally installed capacity and only 0.8 % of generated electricity. With the cut of subsidies for fossil fuels, energy prices are rising fast, both the direct fuel prices as well as the dependent electricity rates.

Wind resources in Egypt

An evaluation of the existing wind atlas shown in Figure 1, is part of this analysis. Especially rural areas were less considered in the development of this wind atlas and show differences to available wind resource data. [2] Thus, a case study is in operation with a locally manufactured wind pole, evaluating the wind atlas at a potential site.

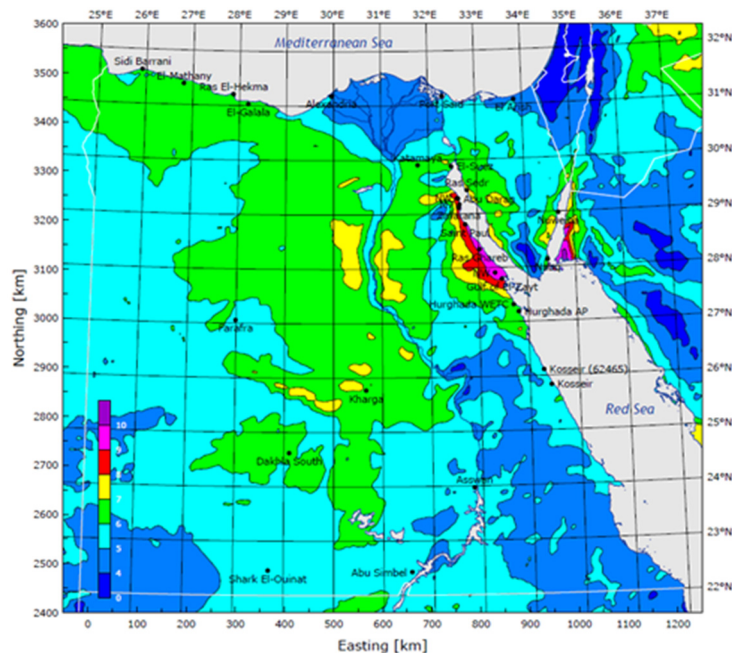


Figure 1: Wind atlas of Egypt: mean wind speed 50 m over ground level using mesoscale modelling [3]

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Utilizing refurbished wind turbines

Wind power in Europe is developing very quickly due to the European energy goals and the intensive subsidisation available in many European countries. Following a subsidisation period, the currently installed wind turbines in Europe are often replaced by bigger and more powerful ones. This offers the opportunity of a prolonged use of these replaced wind turbines by exporting them to countries like Egypt after suitable refurbishment.

SWOT Analyses



Figure 2: SWOT Analyses

Results and Conclusions

An approach with prolonged wind turbines from Central Europe can result in a minimization of investment costs, while local personnel could be trained for doing necessary maintenance work and further gaining local added value. In particular, the replacement of existing large-scale diesel generators, which represent the most affected sector of the last price hikes, is targeted by this survey. Such systems with single or combined diesel generators are still very common and have been identified especially in rural areas for large-scale irrigation or for tourism purposes in the southern Red Sea. Still, the fluctuating framework conditions like governmental restrictions on imports and energy generation does not make the assumption a game-changer and requires a detailed case study including efforts in lobbying and international cooperations.

References

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