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Data Article

Technoeconomic assumptions adopted for the development of a long-term electricity supply model for Cyprus

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ABSTRACT

The generation mix of Cyprus has been dominated by oil products for decades. In order to conform with European Union and international legislation, a transformation of the supply system is called for. Energy system models can facilitate energy planning into the future, but a large volume of data is required to populate such models. The present data article provides information on key modelling assumptions and input data adopted with the aim of representing the electricity supply system of Cyprus in a separate research article. Data in regards to renewable energy technoeconomic characteristics and investment cost projections, fossil fuel price projections, storage technology characteristics and system operation assumptions are described in this article.

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Specifications Table

Subject area	*Engineering*
More specific subject area	*Energy Technology*
Type of data	*Description of main assumptions, tables and figures with model input data*
How data was acquired	*Literature survey (reports from international organizations and journal articles)*
Data format	*Descriptive*
Experimental factors	*Not applicable*
Experimental features	*Not applicable*
Data source location	*Not applicable*
Data accessibility	*Data is available within this article*

Value of the data

- The data provided are required to understand the conditions under which RET technologies are deemed cost-competitive in Cyprus.
- Providing detailed data is important in keeping the process of energy policy-making transparent. This facilitates in building consensus between stakeholders.
- Local universities can take up the developed model and adjust data accordingly to extend the analysis.

1. Data

This data article relates to the analysis conducted in a long-term cost-optimization model focused on the electricity supply system of Cyprus [1]. Data and key assumptions adopted in the analysis are described below in three sections.

1.1. Main modelling assumptions

1.1.1. Electricity supply system

Beyond the existing, committed and planned power plant projects mentioned above, future investments in fossil-fueled and renewable energy technologies are allowed to occur so as to expand the generating capacity of the system, if required, to meet growing demand. Technology options available and assumptions about their parameters can be found in Section 1.2.

In regards to renewable energy technologies, any installations beyond the existing and committed levels (a total of 50 MW CSP with storage, 15 MW distribution-connected PV under net-metering yearly up to 2020, a total of 175 MW wind by 2018) are simply part of the model's minimum cost pathway to satisfy electricity demand. Generic cost assumptions have been adopted in the analysis, whenever specific data for Cyprus were not available. However, the data is aligned with the situation in Cyprus. For instance, the IEA projects investment costs for rooftop PV in 2014 at 2900 EUR/kW [2], while at the moment installations in Cyprus cost 1400–2000 EUR/kW. Previous IRENA assessments report values that are within this range [3,4], so IRENA values are adopted for PV (investment cost of €1665/kW for 2013).

With the assumptions taken on technology costs and performance, as well as fuel prices, solar PV connected at the transmission level appears to be the cheapest electricity generation technology for Cyprus at the moment (Fig. 1). Only the Vasilikos combined cycle gas turbines might have a comparable generation cost in the future, depending on the fuel price at which natural gas will be purchased either from external or future domestic suppliers.