

Should spatial aspects be included in energy system models?

Integrating these spatial aspects in energy system models (ESMs) is not a straightforward issue. Traditionally, the main trade-off in ESMs was between temporal resolution and technological resolution.

How does spatial resolution affect energy models?

There are two main aspects that can affect and limit the spatial resolution that an energy model can reach. The first one is the data availability. Naturally, if the resolution of a model wants to be increased but there is no data available at that precise resolution, the enhancement of the model will be imprecise or even impossible.

Can data availability increase spatial resolution in energy models?

Data availability has indeed been pointed out as one of the main challenges in order to increase spatial resolution in energy models [14]. The second one is related to the specific formulation of each model.

How flexible is the spatial resolution of an energy model?

However, estimating how flexible is the spatial resolution of a model is not straightforward. From a purely theoretical perspective, most energy models are a set of mathematical equations written in a certain software.

Do energy systems have spatial resolution?

Practices found in the literature to account for spatial data in large scale energy system models The goal of this section is to review some common practices used in the literature to include spatial resolution in energy models, ranging from aggregated methods where the spatial granularity is almost non-existent to sophisticated clustering methods.

What is GIS & spatial analysis?

The GIS and spatial analysis comprises 4 main categories. First, spatial claims, which comprise land reserved for military use, land reserved for energy uses, land for transportation, land for fisheries, land for recreation and sand extraction activities. From this analysis the land availability can be derived.

The prediction of future spatial distributions of carbon storage necessitates the application of a spatial simulation analysis based on land use types. Many studies have been conducted in this field, and the CA-Markov [ ...

The energy storage module is connected to the generator module, and transfers electrical energy to the super-capacitors energy storage unit to supply power for the sensors. In this way, long-term monitoring of a sea-crossing bridge by self-powered sensors can be achieved.

THEMATIC ISSUE Energy storage in the geological subsurface: dimensioning, risk analysis and spatial

planning: the ANGUS+ project Alina Kabuth<sup>1</sup> o Andreas Dahmke<sup>1</sup> o Christof Beyer<sup>1</sup> o Lars Bilke<sup>3</sup> o Frank Dethlefsen<sup>1</sup> o Peter Dietrich<sup>3</sup> o Rainer Duttmann<sup>2</sup> o Markus Ebert<sup>1</sup> o Volker Feeser<sup>1</sup> o Uwe-Jens Go<sup>&#168;rke</sup><sup>3</sup> o Ralf Ko<sup>&#168;ber</sup><sup>1</sup> o Wolfgang Rabbel<sup>1</sup> o Tom Schanz<sup>6</sup> o Dirk ...

Due to budget and sensor technology constraints, a single sensor cannot simultaneously provide observational images with both a high spatial and temporal ...

Monitoring the stability of tailings storage facilities (TSFs) is extremely important due to the catastrophic consequences of instability, which pose a threat to both the environment and human life. For this reason, numerous laboratory and field tests are carried out around dams. An extensive database is collected as part of monitoring and field research. The ...

This paper presents the Brillouin optical correlation domain analysis system as an innovative solution for real-time temperature distribution monitoring during battery operation. Our ...

The feasible dimensioning of storage applications is assessed in site-specific numerical scenario analyses, and the related spatial extents and time scales of induced effects connected with the respective storage ...

Feature papers represent the most advanced research with significant potential for high impact in the field. A Feature Paper should be a substantial original Article that involves several techniques or approaches, provides an outlook for future research directions and describes possible research applications. ... Sensors 2022, 22(9), 3573 ...

In this paper we aimed to present a comprehensive review of the role of spatial resolution in energy planning, modelling and analysis, including how GIS and spatial resolution ...

Given the spatiotemporal characteristics of inter-provincial energy storage patent technology transfer data, we chose the Spatial Durbin Error Model (SDEM) and Spatial Durbin Lag Model (SDLM) to analyze the mechanisms influencing China's energy storage technology transfer ...

Accurate temperature acquisition is essential for the thermal management and safety of power batteries in electric vehicles, ships, and energy storage systems. However, current sensor and ...

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