

Is energy consumption a social activity?

Energy is consumed in social environments and in the presence of social peers. But social interactions do not just happen alongside energy behaviour -- the two are intrinsically linked. People do not only consume energy in isolation. Many if not most energy consumption activities are social activities.

What was sociological research on energy consumption in the 1980s and 1990s?

In the 1980s and 1990s, sociological research on energy consumption was scarce and also tended to rely on individualized approaches to consumers' conscious choices. Consumption was predominantly analyzed as a means of communicating to others one's lifestyle, social status, and individual identity.

Is energy consumption an ingredient of social practices?

Indeed, a key advance in the understanding of energy consumption made possible with the contribution of practice theory is the acknowledgment that energy is an ingredient of social practices, as claimed by Shove and Walker (2014), in accordance with Schatzki's (2010) view of material phenomena as part of society.

How do social relations affect energy consumption?

As Tom Hargreaves and Lucie Middlemiss illustrate in their Perspective, these interactions extend beyond explicit energy-relevant behaviours such as managing home temperature or adopting energy efficient technology. Rather, social relations fundamentally impact all aspects of daily routines and consequently when, why and how people consume energy.

Should energy use be a social process?

As proposed by Lutzenheiser (1993), research should go beyond individualized approaches focused on prices and attitudes and, with households and communities as units of analysis, should consider energy use as a social process.

What are the benefits of energy storage?

In cases where extreme weather events could affect the reliability of the power infrastructure, storage can maintain electric service, support critical loads, and enhance grid resilience. A valuable, but less examined, benefit of energy storage is its ability to contribute to the just energy transition.

New technologies, systems, societal organization and policies for energy saving are urgently needed in the context of accelerated climate change, the Ukraine conflict and the past coronavirus disease 2019 pandemic. For instance, concerns about market and policy responses that could lead to new lock-ins, such as investing in liquefied natural gas ...

There are five energy-use sectors, and the amounts--in quadrillion Btu (or quads)--of their primary energy

consumption in 2023 were: 1; electric power 32.11 quads; transportation 27.94 quads; industrial 22.56 quads; residential 6.33 quads; commercial 4.65 quads; In 2023, the electric power sector accounted for about 96% of total U.S. utility-scale ...

bio), Australia needs storage [18] energy and storage power of about 500 GWh and 25 GW respectively. This corresponds to 20 GWh of storage energy and 1 GW of storage power per million people.

The findings indicate the favorable influence of several elements on PV energy system social acceptability, including PV energy system awareness, PV energy system ...

In this scenario, energy storage systems (ESSs) are enabling technologies to boost the stability and flexibility of the power grid in the short-to-medium term, allowing local ...

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Up to 85% less energy consumption vs. competitive all-flash storage. ... sustainability isn't a buzzword. It's woven into the fabric of everything we do. We're building the most energy-efficient data storage on the planet and leading the industry: ... Company Our Vision Careers Sustainability and Social Impact Investor Relations ...

Progress in reducing the energy intensity of the global economy continued to accelerate, improving by a 2.1% compound average annual growth rate between 2010 and 2016 [41]. 4 In 2015, the share of renewable energy in total final energy consumption climbed to reach nearly 19%, continuing the slight acceleration of trends evident since 2010 [28].

1. Introduction. In order to combat climate change, the consumption of sustainable energy resources can support in lowering massive reliance on conventional fossil fuels [1]. PV-based sustainable energy systems are gaining public attention globally due to their environmental, economic [2] and climate change significance [3]. Several developed countries ...

Renewable, decentralised, and citizen-centred energy paradigms have emerged as feasible and reliable alternatives to the traditional centralised fossil-based infrastructure. In this scenario, energy storage systems (ESSs) are enabling technologies to boost the stability and flexibility of the power grid in the short-to-medium term, allowing local communities to envision ...

Sustainability in buildings is a concept that has multidimensional pillars, such as environmental, economic, social, ecological, technical, and technological aspects [6]. Green and sustainable buildings can help mitigate the impacts of buildings on the environment, economy, and society [10]. Moreover, attainment sustainability in buildings by reducing GHG emissions ...

From this perspective, we define "social energy" as a complex ... the identity of users evolves and new identities are created for energy users, based on the production, consumption, storage, and distributed management of energy. ... and  $x_t = [x_{1,t} \ x_{2,t} \ \dots \ x_{6,t}]^T$ ,  $x_t$  is the control variable in this case study. B. The Neural Network Based ...

One area in AI and machine learning (ML) usage is buildings energy consumption modeling [7, 8]. Building energy consumption is a challenging task since many factors such as physical properties of the building, weather conditions, equipment inside the building and energy-use behavior of the occupants are hard to predict [9]. Much research featured methods such ...

The total energy produced only makes up for a part of the total energy consumption. On the contrary, Pakistan possesses a huge potential for renewable energy sources like wind, solar, hydropower ...

The impacts can be managed by making the storage systems more efficient and disposal of residual material appropriately. The energy storage is most often presented as a "green technology" decreasing greenhouse gas emissions. But energy storage may prove a dirty secret as well because of causing more fossil-fuel use and increased carbon ...

It's useful to look at differences in energy consumption per capita. This interactive chart shows the average energy consumption per person each year. A few points to keep in mind when considering this data: These figures reflect energy consumption - that is the sum of all energy uses including electricity, transport and heating. Many ...

Distributive justice requires a fair allocation of both the advantages and disadvantages of energy production and consumption Footnote 3 In the context of energy storage, this principle necessitates that the environmental and social consequences of batteries--from resource extraction to disposal--should not be unequally borne by specific ...

The inherent power fluctuations of wind, photovoltaic (PV) and bioenergy with carbon capture and storage (BECCS) create a temporal mismatch between energy supply and demand. This mismatch could lead to a potential resurgence of fossil fuels, offsetting the effects of decarbonization and affecting the realization of the Paris target by limiting global warming to ...

It is concluded that this kind of energy storage equipment can enhance the economics and environment of residential energy systems. ... power consumption and energy storage equipment to optimize ...

Renewable energy can make considerable contributions to reducing traditional energy consumption and the emission of greenhouse gases (GHG) [1]. The civic sector and, notably, buildings require about 40% of the overall energy consumption [2]. IEA Sustainable Recovery Tracker reported at the end of October 2021 that

governments had allocated about ...

Social Energy aims to make 100% renewable energy and battery storage commercially viable for everybody. Background Within the UK energy industry, Half-Hourly Settlement (HHS) is an integral part of our new smarter, more flexible future energy system.

Configuring energy storage devices can effectively improve the on-site consumption rate of new energy such as wind power and photovoltaic, and alleviate the planning and construction pressure of external power grids on grid-connected operation of new energy. Therefore, a dual layer optimization configuration method for energy storage capacity with ...

A Li-ion battery is selected due to its paramount properties for energy storage [44]. A maximum capacity of 30,000 kWh is set with a limiting charge or discharge ratio in a given hour of 10% of the total capacity [3]. Hydrogen is produced by electrolysis of water assuming a specific energy consumption of 53.14 kWh/kg H<sub>2</sub> [60].

With the large-scale access of renewable energy, the randomness, fluctuation and intermittency of renewable energy have great influence on the stable operation of a power system. Energy storage is considered to be an important flexible resource to enhance the flexibility of the power grid, absorb a high proportion of new energy and satisfy the dynamic ...

Europe and China are leading the installation of new pumped storage capacity - fuelled by the motion of water. Batteries are now being built at grid-scale in countries including the US, Australia and Germany. Thermal energy storage is predicted to triple in size by 2030. Mechanical energy storage harnesses motion or gravity to store electricity.

Techno-economical and social analysis of energy storage is conducted for commercial buildings. ... Public buildings account for 13.6% of the national total buildings by area, but account for 21.7% by energy consumption [3]. Commercial buildings, as typical public buildings, contribute to most of the above energy consumption, but their demand ...

The purpose of Energy Storage Technologies (EST) is to manage energy by minimizing energy waste and improving energy efficiency in various processes [141]. During this process, secondary energy forms such as heat and electricity are stored, leading to a reduction in the consumption of primary energy forms like fossil fuels [ 142 ].

Thus, by storing energy during off-peak hours and discharging energy during peak hours, ESSs even out energy prices, improving social welfare . Sioshansi et al. [ 9, 10 ] have shown that the gain from using ESSs depends on their ownership, given the different incentives of each market player.



## Social energy consumption and energy storage

This research delves into a case study of a photovoltaic (PV) energy community, leveraging empirical data to explore the integration of renewable energy sources and storage solutions. By evaluating energy generation and consumption patterns within real-world energy communities (a nominal generation capacity of 33 kWn) in Gipuzkoa, Spain, from May 2022 to ...

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