

We show that a solid-state apparatus with no moving parts can harvest electrical power from the wind. This apparatus, a Solid-state Wind-Energy Transformer (SWET), uses coronal discharge to create negative air ions, which the wind carries away from the SWET. The SWET harnesses the wind-induced currents and voltages to produce electrical power.

In wind energy conversion systems, the fundamental frequency step-up transformer acts as a key interface between the wind turbine and the grid. Recently, there have been efforts to replace this transformer by an advanced power-electronics-based solid-state transformer (SST). This paper proposes a configuration that combines the doubly fed induction generator-based ...

She X, Huang AQ, Burgos R. Review of solid-state transformer technologies and their application in power distribution systems. *IEEE Journal of Emerging and Selected Topics in Power Electronics*. 2013; 1 (3):186-198; 24. ...

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Solid-state transformers (SSTs) have the potential to replace the conventional line-frequency transformer (LFT) in many applications, such as in electric traction, renewable energy systems, and ...

A new control scheme for a wind energy conversion system connected to a solid-state transformer-enabled distribution microgrid that combines a classical PI placed, in a nested-loop configuration, with a passivity-based controller. In this paper, we propose a new control scheme for a wind energy conversion system connected to a solid-state transformer-enabled ...

You'd need a water line run to installations and it wouldn't work at freezing temperatures. But there's another idea called the Solid-State Wind-Energy Transformer (with the unfortunate acronym ... SWET) developed by Richard Epstein.

This study proposes an optimal planning technique for a solid-state transformer (SST) fed hybrid energy hub consisting of a wind turbine distributed generator (WTDG) and a battery energy storage system (BESS) in a distribution network (DN). The energy exchange within the energy hub and with the utility grid is regulated by an efficient energy ...

For the installation of solar or wind energy, solid-state transformers are required. Grids are connected to electricity sources using solid-state transformers. New renewable power plants and rising energy consumption will drive the solid-state transformer market. Additionally, renewable energy sources have been stressed by

the government ...

The solid-state transformer (SST) has been found to be useful in integration of different distributed energy sources as well as wind power in the distribution grid with multiple functionalities ...

Further, SST outcrop suchlike reliability, resiliency, and stability using SST are presented. The modern power systems have now prompted the practice of power electronics-based converters for power conversion purposes, which has emerged a solid-state device named as solid-state transformer (SST).

In this manuscript, artificial neural network PI (ANN-PI)-based controller is presented for a reduced switch cascaded multilevel inverter (RSCMLI) applied to wind energy conversion system (WECS) integrated with a solid-state transformer (SST). To improve the power quality by harmonic reduction, a seven-level RSCMLI is proposed. The utility-side parameters and the dc ...

A solid state transformer (SST) is an ac-ac converter that can replace conventional transformers used in distribution systems. SST is also known as power electronic transformer (PET) [114,115] or intelligent universal transformer (IUT) [116].The concept of SST was first introduced in Ref. [117] in 1970. Later development of SST includes the SST proposed by Brooks in 1980 [118], ...

modern wind energy system similar to that shown in Figure 9 can be created, ... Burgos R, Huang A. Solid state transformer interfaced wind energy system with integrated active power transfer, reac-

Authors to whom correspondence should be addressed. Solid-state transformers (SSTs) have emerged as a superior alternative to conventional transformers and are regarded as the building block of the future smart grid.

This study proposes an optimal planning technique for a solid-state transformer (SST) fed hybrid energy hub consisting of a wind turbine distributed generator (WTDG) and a ...

Solid-state transformer (SST) technology is one of the developing technologies that will be widely used in the future to integrate low-voltage and high-voltage networks with control circuitries and power electronics converters, facilitating renewables integration in smart grid applications. SST technology has crucial key advantageous features, including compact ...

Solid-state transformers (SSTs) have emerged as a superior alternative to conventional transformers and are regarded as the building block of the future smart grid. ..., system utilizing SST in the wind energy system is presented. It offers a family of wind energy systems utilizing SST, which enables control of active power and compensation of ...

The solid-state transformer (SST) has been regarded as an emerging technology where emphasis is mainly on the design of the device. To explore its system integration opportunities, this paper proposes and demonstrates

Solid state wind energy transformer

a SST interfaced permanent magnet synchronous generator (PMSG) wind energy conversion system. The system integration ...

Solid state transformers (SSTs) are identified as a potential solution to modernize and harmonize alternating current (AC) and DC electrical networks and as suitable solutions in applications such as traction, electric ships, and aerospace industry. ... Syed, I.; Khadkikar, V. Replacing the grid interface transformer in wind energy conversion ...

But there's another idea called the Solid-State Wind-Energy Transformer (with the unfortunate acronym ... SWET) developed by Richard Epstein. His approach is very similar to what the Dutch developed, but instead of using water his concept uses ionic currents to produce electricity. This process is called "electrohydrodynamics". 8

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She X, Huang AQ, Burgos R. Review of solid-state transformer technologies and their application in power distribution systems. IEEE Journal of Emerging and Selected Topics in Power Electronics. 2013; 1 (3):186-198; 24. Kolar JW, Ortiz G. Solid-state-transformers: Key components of future traction and smart grid systems.

A multiport DC solid-state transformer for MVDC integration interface of multiple distributed energy sources and DC loads in distribution network. IEEE Trans. Power Electron. ...

Solid state transformer · Multi-port solid state transformer · FEA · High frequency transformer · Energy internet · Energy router . Nomenclature . Symbol Defination . f . s. Switching frequency L. ab. The equivalent inductance between the port-a and port-b L. 1,L. 2,L. 3. Phase self inductances for the delta connection L. 12

The ongoing energy transition has changed the architecture of electricity networks in ways that conventional power transformers are not able to cope with the new required functionalities. For this purpose, the solid state transformer (SST), which comprises state of the art power electronics with galvanic isolation to interconnect two separate alternating current (AC) ...

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