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Smart Grid System

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Abstract

In this modern energy scenario it has become urgency to rely more on renewable energy sources due to various issues such as poor efficiency of thermal and nuclear power station, inflation of losses due to increase in demand, international policies of global warming, environment degradation due to nuclear wastes and even many more. So we can say that it has become a compulsion to shift towards non conventional energy sources. There is no limit of innovative research in renewable energy field due to its huge availability, pertain-ability and habitat friendly with respect to all living organism. So our intention must be of accessing 100% non conventional sources with maximum efficiency because major problem is of harnessing it. However discordant, seasonal and irregularity in its distribution upset to integrate all these to have an intelligent power station. Even these sources have less capacity as compared to fossils fuel generating station and overall installation technology and costing is more advanced. This paper is a layout of adding all non conventional sources to form classy grid stem. We are also discussing the current projects going under this.

Keywords: *Grid System, Hydrogen Cell Energy, Smart Grids.*

Introduction

An extant generating system is considered to be a major reason for "greenhouse or global warming" effects that cause environmental impacts due to use of fossil fuels, specifically black gold. In respect to fossil fuels, "renewable power" bid alternative sources of energy which are pollution free, technologically effective and follow sustainable principles. There is bizzare attention to RE, particularly solar and wind energy, because they don't give rise to co2 emissions. However, most of the present transmission and handling networks are considered as "paralyzing" sys- terms as they are not capable of providing back the smart data required for a modern "power station" operation. The present power energy grid has no potential to offer adequate services addressing energy efficiency, reliability and security, or the integration of RE at the scale needed to meet the clean-energy demand for the future. The energy transition means much more than just a switch to renewable sources: it is a comprehensive technical, economic and socio-cultural paradigm shift of the entire energy system. Not only will primary energy carriers will be replaced, but the entire system of production, transport, distribution and use will undergo a fundamental transformation over a short period of time. In the future, electricity will no longer be transported in a single direction – from several large fossil or nuclear power plants to consumers – but rather, as renewables come to represent an ever increasing share of the total power supply, a multidirectional flow will develop and connect an untold number of new market players Information and communications technology (ICT) will be essential to manage the resulting complexity.

Smart Grids

There is no generally accepted definition of the term Smart Grid. Different stakeholders interpret it according to their specific viewpoint. On a very general level, it just means that ICT meets the power sector. But these two sectors come with very different perspectives:

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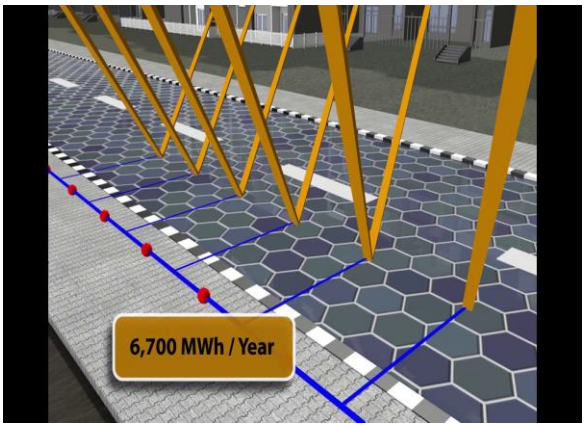
(1) A component perspective, which focuses on modernizing the electricity grid or parts of it (smart meters). This is predominantly the perspective of the power sector, but also of the Energy Directorate of the Federal Ministry of Economics and Technology (BMWI) and the German regulator, the Federal Network Agency (Bundesnetzagentur "BNetzA").
(2) An integrated systemic perspective, which starts from the idea of a smart future energy system ("Internet of Energy"). This is mainly the ICT perspective, which understands that the parts of a system that adopt information and communication technologies always will converge towards common interfaces.
So far, the groups whose main interest is the acceleration of the energy transition have not entered this debate with their own perspective but have largely been bystanders. It is argued here that a smart grid tailored to the requirements of an electricity system based on a large share of renewables will be key to the success of the energy transition.

Modernized Grid

The Component Perspective Characteristic for the component perspective is a strong focus on modernizing single elements of the national grid, most notably meters and distribution girds. Driven by European energy efficiency goals, a focus on smart metering can be traced back to policies34 from Brussels. In Germany the Energy Directorate of the Federal Ministry of Economics and Technology (BMWI) has reacted to European and German climate policies since 2008 by trying to trigger a market-driven roll out of smart meters. Accordingly, the BMWI defines smart grids5 with an elaborated reference to smart meters as the basis for variable tariffs and new business opportunities. Up to now, however, the desired markets could not be developed.
Another important strand of the "component" debate takes place within the German power sector and is backed by the Energy Directorate of the Federal Ministry of Economics and Technology. The issue is a very practical one: How can smart grid technologies solve the problems caused by a rising share of renewables?

Different Available Sources

(a) Piezoelectric Road



Piezoelectric crystals and products that are the heartbeat of piezoelectric transducers, piezo pick-ups, piezoelectric actuators, and piezoelectric generators in a multitude of applications. Piezoceramic products are manufactured from lead zirconate titanate (PZT), lead metaniobate, and other piezoelectric materials. This crystal can be implemented as tiles along the main road going through cities. The generating capacity of piezoelectric devices can be crudely over-approximated by assuming that the vibrations in the road are caused by traffic alone, and that each "vibration event" from one vehicle is independent of another (i.e. the vibrations are sufficiently dampened before the next vehicle passes). Under these assumptions, the total energy harvested by piezoelectric devices along a one-kilometer stretch is at most the number of cars that pass multiplied by the vibrational energy that one car transfers to the road.

2. Hydrogen Cell Energy

Hydrogen in liquid form is very light with a density of 77Kg/m3, just over one tenth that of petrol /gasoline (702 Kg/m^3) but kWh/Kg its calorific energy density of 39.4 k Wh/Kg is three times that of petrol (13kWh/Kg).

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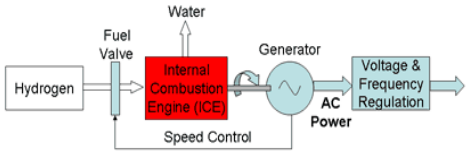
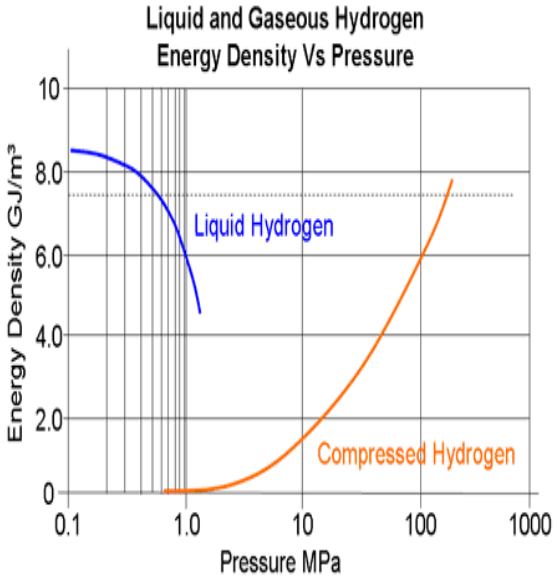


Hydrogen Powered Internal Combustion Engine (ICE) Generator



Solar Technology

There are many advantage of floating solar palates as compared to rooftop which are written below:

First, the cooling effect of the surrounding water preserves PV panel efficiency, meaning that a floating panel produces more electricity than its ground- or roof-mounted counterpart

Second, the shade cast by floating solar installations onto the water's surface reduces both the loss of water by evaporation and the growth of nuisance algae.

Solar photovoltaic cells consist of a positive and a negative film of silicon placed under a thin slice of glass. As the photons of the sunlight beat down upon these cells, they knock the electrons off the silicon. The negatively-charged free electrons are preferentially attracted to one side of the silicon cell, which creates an electric voltage that can be collected and channeled. This current is gathered by wiring the individual solar panels together in series to form a solar photovoltaic array. Depending on the size of the installation, multiple strings of solar photovoltaic array cables terminate in one electrical box, called a fused array combiner. Contained within the combiner box are fuses designed to protect the individual module cables, as well as the connections that deliver power to the inverter. The electricity produced at this stage is DC (direct current) and must be converted to AC (alternating current) suitable for use in your home or business.

Conclusions

To detect the fault and to protect the person who resolving fault by password based protection system.

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