Power Electronic (Asmir Numan)

Name = Shafiv ID = 14859 Page 1

Answer No 1

Solar thermal and hybrid just seem to have an increasingly tough time hitting their Paybacks for large installations. not because either of those are different but because the juggernaut of PV has rolled so strong and so hard through the building technologies Sector PV keeps making it harder for everything else to Compete.

My approach on this is to assume that the human Cost is inevitably the expensive one mistakes Cost more than high technology training is expensive People rotate through jobs they Call in Sick they vary the way they interact with Systems.

PV seems to be best Positioned to minimize the human Cost of Power once installed the maintainance is minimal. there are few integration Problems of weather sealing like with hybrid Systems not having to maintain and replace things like Pumps and Compressors is helpful. I've seen some wonderfull hybrid technologies but they are ~~inv~~ inevitably Custom made and just Can't Compete on Power with PV which is rolled off of assembly lines like taffy. PV was just the.

the lucky one to benefit from Scale integration Partly as a byProduct of the Semiconductor Industry. The regulations building Codes and Processes are being optimized for Pv in ways that they just Can't Standardize for less Popular System.

The Problems you mention about Integration with PV are with us for Solar thermal and hybrid as well. they all need Variations in Code and training But with Pv. the whole Industry is working to the Resolution of the Integration Issues.

Answer No 2

A grid forming Control Can be technically Converted to a grid Supporting Control by adding a droop Control interface and Virtual Impedance The essence of this is to allow the Paralled operation of Several Inverters in Paralled. Performing the Same frequency and Voltage regulations Simultaneously based on there respectiv Capacities and droop gains Each Inverter in the grid Supporting arrangement emulates a typical Synchronous ~~generator~~ Voltage Source and they

they are Connected to the rest of the grid using a link Impedance Similar to a typical Synchronous Generator However this link Impedance can be emulated in Control. The virtual Impedance helps Solve the drawbacks of the Conventional droop Control.

A grid forming Control is used for a Single Inverter to Set the voltage amplitude and frequency in an Islanded microgrid Please note that it does not operate in Paralled with any Inverter and doesnt Share the Voltage and frequency regulation responsibility with any Inverter.

A grid Supporting operating as a Current Source has the main objective of delivering Power (active and reactive) This is technically an Improved grid feeding Control that uses the droop Control to Contribute to the main frequency and Voltage regulation and may operate in Paralled with other "like-minded" Inverters.

A grid Supporting operating as a Voltage Source (grid Supporting- grid forming) doest operate Synchronusly

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...ble for large

with a traditional grid System it operates within a large autonomous microgrid just as a grid forming Controlled Inverter. In this Case, it is Called grid Supporting not because it is Connected to a traditional main grid. It is Called grid Supporting because it operates in in Paralled with "like-minded" Inverters with the Same grid Supporing Control Strategy with the help of the droop these Inverters are able to Collectively regulate the frequency and voltage amplitude of the autonomous microgrid where they operate In fact I am Currently working on an autonomous Inverter- based microgrid and I applied grid Supporting Controls for all the Constituent Inverters. This is the more reason why Contributed to the discussion.

Answer No 3

Both technologies Should be developed as quickly as Possible So that Cars based on electromobility and other ecological energy Source become widely available. The Instrastructure of the battery

Charging Station and hydrogen-oxygen fuel should also be built which technology will develop to a greater extent will be determined by the time and Cost of Charging the fuel.

Hydrogen fuel Cell vehicles tent to be more frugal than their battery electric Counterparts. According to Autocar the Hyundai Nexo comes with a real-world range of 414 miles and filling up takes just five minutes whereas electic charging can be an hour-long affair at the best of times.

Will the technologies of electric motors and the new generation of batteries installed in cars and other motor vechicles be developed in the Scope of the main directions of development of electromobility of the automotive industry? will the technology of hydrogen engines or other types of engines developed as Part of the development of eco-motorisation? At Present in the majority of Countries there is no financial resource for financing high-budget Pro-ecological Project from

Electronic (Aamir Aman)

Page 1

ame Shafiq (ID 1485-4 Page 6

from Public Financial funds? Should new, new auto ecological Innovations new technological Solutions in the field of renewable energy Sources new ecoelectrodes Producing electricity for the needs of electromobility in the automotive Industry, new generation of batteries Photovoltaic Panels energy Storage and transmission Stations hydrogen and other engines If this Process lasts much than by 2030 there may not be enough time to Carry out the necessary reforms to reduce greenhouse gas emissions and Consequently, the Planet's warming Process will accelerate Considerably. this Process will be Irreversible and will Continue to accelerate and towards the end of the 21st Century will lead to a global climate disaster that threatens the life of all humanity and most other forms of life on earth.

Answer 4

The boost Converter is used to "Step-up" and Input voltage to Some higher level required by a load This unique Capability is achieved by Storing energy in a Inductor and releasing it to the load at a higher voltage This brief note highlights Some of the more Comon Pitfalls

when using boost regulators.

The buck Converter is so named because the Inductor always "bucks" or acts against the Input Voltage The output Voltage of an ideal buck Converter is equal to the Product of the Switching duty Cycle and the Supply Voltage when the Switch is opened the Supply Current to the Inductor is Suddenly Interrupted.

Answer No 5

→ The function of the CycloConverter is to Convert Constant voltage, Constant frequency into variable voltage and variable frequency without any Intermediate Stage.

Principle of CycloConverter:

The CycloConverter Consists of dual Converter in which one Converter work as positive Converter whereas the other as the negative Converter.

Types of CycloConverter

According to frequency

i) Step up CycloConverter

II) Stepdown CycloConverter.

According to outPut Voltages:

I) Single Phase to Single Phase
   a) Centre taPed CycloConverter and
   b) Bridge Configuration Cycloconverter
II) Single Phase to three Phase
III) Three Phase to three Phase.

* All types of CycloConverter are Phase Commutated except step up CycloConverter The step up CycloConverted is forced Commutated

Advantages:

* Higher efficiency due to Single Stage Conversion
* All the CycloConverter works on line Commutation except step up CycloConverter therefore it is not necessary for extra Commutating Components.
* The Power transfer from Supply to load and vice versa at any Power factor.
* it Can operate at distorted outPut waveform in the Case of one SCR gets damaged.
* it Can generate high quality Sinusoidal waveform Particular at low frequency whereas the static inverter generate step wave Voltage waveform at low ~~freq~~ frequency (<10Hz)

Disadvantages:

* Control Circuit becomes complex due to high number of SCRs.
* Low Power factor for low output voltage
* The Supply should be short Circuited due to failure of Commutation Circuit.