**COMMENTS P1 WHEN CORRECTING REPORT**

* Is the STC the maximum power that can be obtained from the PV panel? In the report we call Pmax at the max power under STC and Pmpp for all the other conditions.
* Does the inverter have a MPPT controller if there is no MIC?
* Switching frequency of the system selected to be 50kHz so learn the pros and cons of high/low switching frequency. Why we chose that frequency?
* CCM/DCM explain this
* Limitations of buck and boost converters regarding number of panels (equations 2.1 and 2.2). Why haven’t we addressed the transition between modes?
* R\_limiting what is it used for?
* Why do we need filtering in the sensors if the capacitors have been selected to have low voltage ripple?? To avoid high frequency noise.
* Input range of the RT box we say it is 0-5V but we have used -10-10V in the lab. Maybe Tamas will say something about this because he told us to define the range to -10-10V
* 80kHz cut-off frequency for the current sensor
* Assuming CCM, the average PV current is...(eq 4.18-4.20). How would this be in DCM? Try to calculate minimum value of average current in the inductor in CCM (see 3Dplot).
* Why it takes more time to reach the MPP in boost mode?
* Consider including the thermal test in the presentation but not in the report.
* As in buck mode the current is higher than in boost it would be the worst case for the converter’s efficiency. This is what we will say in the exam if they ask why we didn’t measure the efficiency in boost mode. Consider deleting it from the report and including it in the presentation.
* Look for some references of commercial MPPTs to compare the tracking time with the results we obtained.
* What’s the difference on using a lower/higher frequency for the MPPT?

MPPT frequency why not 10kHz why not 1kHz. (Oscillations in steady state are higher with 10Hz)

* What are the limitations for our PV model?

**COMMENTS STEF 05/01/19**

* Tests missing before the project exam:
* Converter’s efficiency working in boost mode.
* Sudden change in irradiance and temperature in boost mode.
* If possible, test the PI controller under STC conditions and compare with the results obtained for P&O.
* Thermal test?
* Abstract: We mention that by working at MPP it’s possible to achieve the highest efficiency. But, can we show this PV panel’s efficiency improvement? We have checked the MPPT’s and converter’s efficiency, but we haven’t with the PV panel. Our PV panel has an efficiency of 15.5%. I would be very careful when talking about improving the PV panel’s efficiency as actually we don’t do it. With the MPPT we try to obtain the maximum possible amount of power from the PV panel under the currently environmental conditions.

Solar panel’s efficiency can be improved by studding the light-receiving semiconductor surface.

* + Efficiencies of solar panel can be calculated by MPP (maximum power point) value of solar panels
  + [Solar inverters](https://en.wikipedia.org/wiki/Solar_inverter) convert the DC power to [AC](https://en.wikipedia.org/wiki/Alternating_current) power by performing MPPT process: solar inverter samples the output Power (I-V curve) from the solar cell and applies the proper resistance (load) to solar cells to obtain maximum power.
  + MPP (Maximum power point) of the solar panel consists of MPP voltage (V mpp) and MPP current (I mpp): it is a capacity of the solar panel and the higher value can make higher MPP.

Micro-inverted solar panels are wired in [parallel](https://en.wikipedia.org/wiki/Series_and_parallel_circuits#Parallel_circuits), which produces more output than normal panels which are wired in [series](https://en.wikipedia.org/wiki/Series_and_parallel_circuits#Series_circuits) with the output of the series determined by the lowest performing panel (this is known as the "Christmas light effect"). Micro-inverters work independently so each panel contributes its maximum possible output given the available sunlight.[[15]](https://en.wikipedia.org/wiki/Solar_panel#cite_note-15)

Wiki: “Each module is rated by its [DC](https://en.wikipedia.org/wiki/Direct_current) output power under standard test conditions (STC), and typically ranges from 100 to 365 [Watts (W)](https://en.wikipedia.org/wiki/Watt). The [efficiency](https://en.wikipedia.org/wiki/Solar_cell_efficiency) of a module determines the area of a module given the same rated output – an 8% efficient 230 W module will have twice the area of a 16% efficient 230 W module. There are a few commercially available solar modules that exceed efficiency of 24%[[1]](https://en.wikipedia.org/wiki/Solar_panel#cite_note-1) [[2]](https://en.wikipedia.org/wiki/Solar_panel#cite_note-2)”

“Because Module Efficiency measures the power generated per square metre of your panel, all efficiency really means is that a less efficient solar panel will take up more room when compared to a more efficient panel. Wattage or the size of your panel, is what really matters when measuring how much electricity your panel with generate. If you’re tossing up between two similar panels, don’t let Module Efficiency be your deciding factor. Module Efficiency is a good indicator of overall panel quality. If a solar panel manufacturer can produce a panel with a high efficiency, it indicates they’ve invested heavily in research and development, and that your panel will last a long time. Unless you’re working with a minuscule roof space and extremely high energy bills, we don’t think it’s worth the extra cost when compared to installing a high-quality panel with a decent efficiency.”

* Module integrated converters:

When quantifying the amount of power loss in the case of partial shading I don’t understand the explanation in the report (power loss of 33%?).

What are the characteristics of the PV panel for figure 1.3? Explain the figure again I don’t understand the values for the global and local MPP.

What happen if there is partial shading and we use MICs instead of bypass diodes? The total power generated by the PV panel that is shaded will not be the same as the power generated by the other panels either… The power generation will be higher than with bypass diodes as the power generated by the PV panel will not be zero but how much improvement will we get?

Advantages and disadvantages (better comparison) between DC-DC converters and Microinverters. Maybe give some numbers on how less efficient is a mucroinverter in comparison with a DC-DC converter.

* System requirements: why did we choose exactly those values for the ripples?? In the table the max inductor’s current ripple is set for 400 irradiance and 25 temperature but we don’t mention here that we decided to use that conditions as the minimum