



Project PV OpMaat Workshop “Power Electronics for BIPV”

Closure
2018-09-11

Agenda morning

11:00 – 11:30

Welcome reception

11:30 – 13:00

Session 1: BIPV + PE interplay

Welcome

Ronnie Belmans (EnergyVille/KU Leuven)

PV OpMaat project

Ando Kuypers (Solliance)

EnergyVille Introduction

Johan Driesen (EnergyVille / KU Leuven)

Requirements for BIPV Electronics

Stefan Dewallef (Soltech)

13:00 – 14:00

Lunch + networking

14:00 – 14:30

Lab Tour, EnergyVille 1



Agenda afternoon

14:00 – 14:30 **Lab Tour, EnergyVille 1**

14:30 – 16:00 **Session 2: PE technology**

Module-level converters for BIPV

Simon Ravyts (EnergyVille / KU Leuven)

Reliability challenges for module-level converters

Wieland Van De Sande (EnergyVille / U Hasselt)

Certification of PV Modules and Electronics

Norbert Lenck (VDE Renewables)

16:00 – 16:15 **Break**

16:15 – 17:00 **Interactive roadmap to solutions**

17:00 **Closing reception**



Q&A Session

- To what extent can efficiency be sacrificed in favor of reliability? (Stefan, Wieland)
 - Most important trade-off with efficiency is by power de-rating at high temperature (Stefan D.)
 - More important trade-offs of reliability (and efficiency) are vs. cost and size
 - De-rating in extreme conditions is ok, but cannot occur regularly in order not to reduce energy yield (as it does with some microinverters)
- How should we tackle the lack of models for failure on all components? (Wieland, Stefan)
 - Component and/or converter manufacturers should collaborate with research institutions to develop them
 - This would require a physics-of-failure based test for specific components, e.g. capacitors (input from Geert Willems, imec)



Q&A Session

- What is the size of a “standard” BIPV module? (Simon)
 - Stefan D.: No real standard, 20 cell is Soltech’s minimum, size is adapted to façade requirements – sticking to 1 m width has the advantage that one person can carry it
- Comments about earth fault of PV (Simon)
 - Depends on the grounding method chosen (TN-S, IT, ...)
 - Single earth fault is not dangerous if PV is isolated
- Is the lifetime calculation verified by tests? (Wieland)
 - There is no way to accurately predict 25 years of lifetime for any electronics (Geert)
 - Linear failure rate assumption is most certainly wrong, only applies to random causes of failure

Q&A Session

- How do we know that the testing profile is relevant to the operational life of the PV application? (All)
 - Standard IEC tests do not aim at guaranteeing a lifetime (Norbert L., VDE)
 - Multiplication of test duration(e.g. Damp Heat) increases safety
 - Test procedures are not specific to BIPV (as of yet)
- How to create more awareness in Architects / Designers around BIPV concepts/benefits? (All)
 - They all have (or should have) heard about it by now
 - Most importantly their customers have to want it



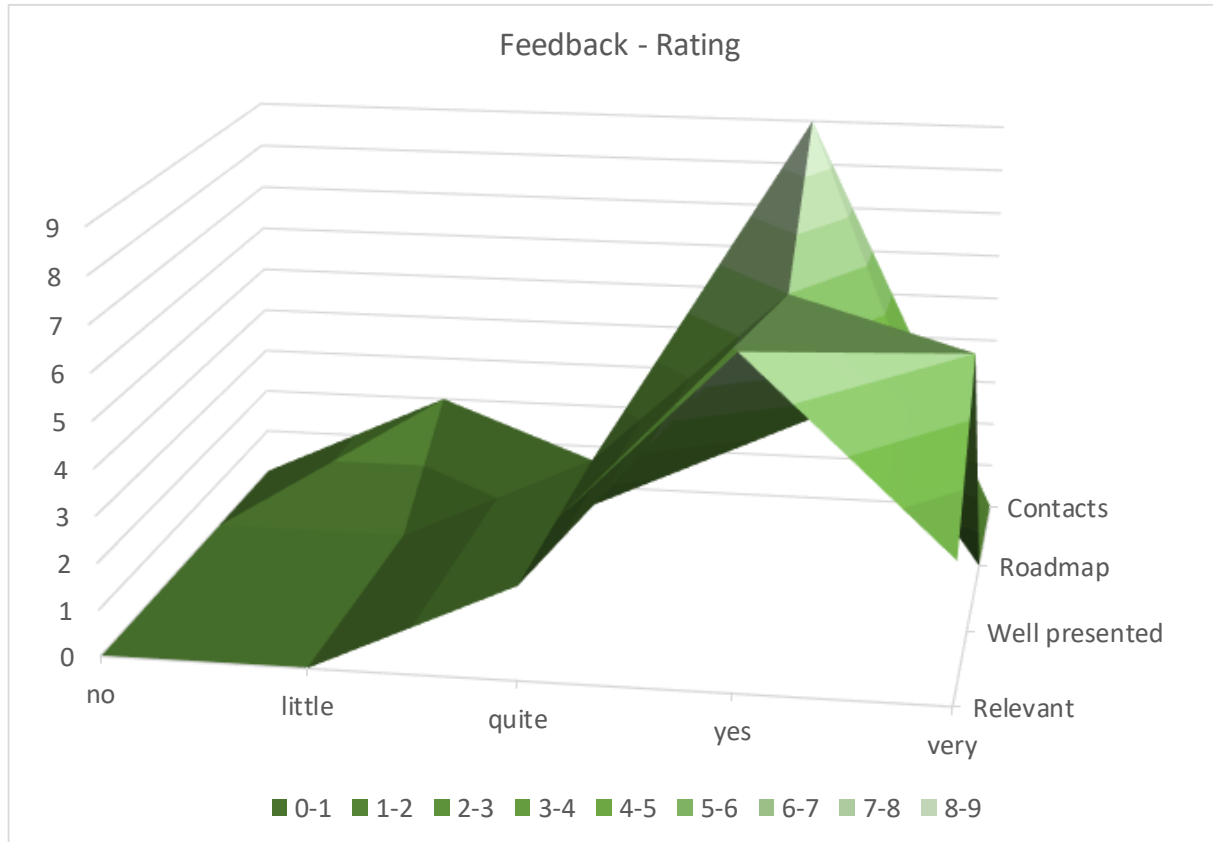
Conclusions

- Criteria influencing power electronics for BIPV the most (in that order): reliability, size, cost
- Lifetimes of > 25 years cannot be ensured
- Thus converters have to be replaceable / repairable
- Detailed physics-of-failure investigations are needed to ensure reliability
- In DC converters, electrolytic capacitors can be avoided, which are most critical in lifetime

Wait... wasn't there a roadmap promised? Well, these topics are, or will be, included in our roadmap, and we will be working on them to make BIPV (more) viable! Stay in touch for details. Thanks to all for your input!



Ranking Feedback



- 13 participants gave feedback
- Many appreciated making new contacts
- Quality of presentations ranked good or very good by most

Textual Feedback

Liked:

- Practical info from Soltech
- Confirmation of EnergyVille's ideas
- Good contact possibilities
- Content of presentations
- Lab tour

Lacking:

- More technical power converter / topology / simulation info
- Power converter cost & efficiency info
- Real life info
- Percentage of power electronics presentations too low
- How to design for guaranteed lifetime
- Breadth & depth of topics
- Influence of thermal management on output and lifetime
- Work that was actually done in PV OpMaat





Thank you for your participation!

