



GLOBAL PV INDUSTRY & TECHNOLOGY ASSOCIATION

Harmonizing Data Collection from the Field to Improve PV Manufacturing

ETIP-PV General Assembly Conference 2018

3 May 2018

Quality ?

- What does quality means ?
 - « The ability to reach expectations »
- A PV component should behave as expected during the lifetime of the PV plant.
- Predictable production, predictable degradation, possible corrections through maintenance
- What could be the financial impact of risks on quality ?

Solar United Quality WG

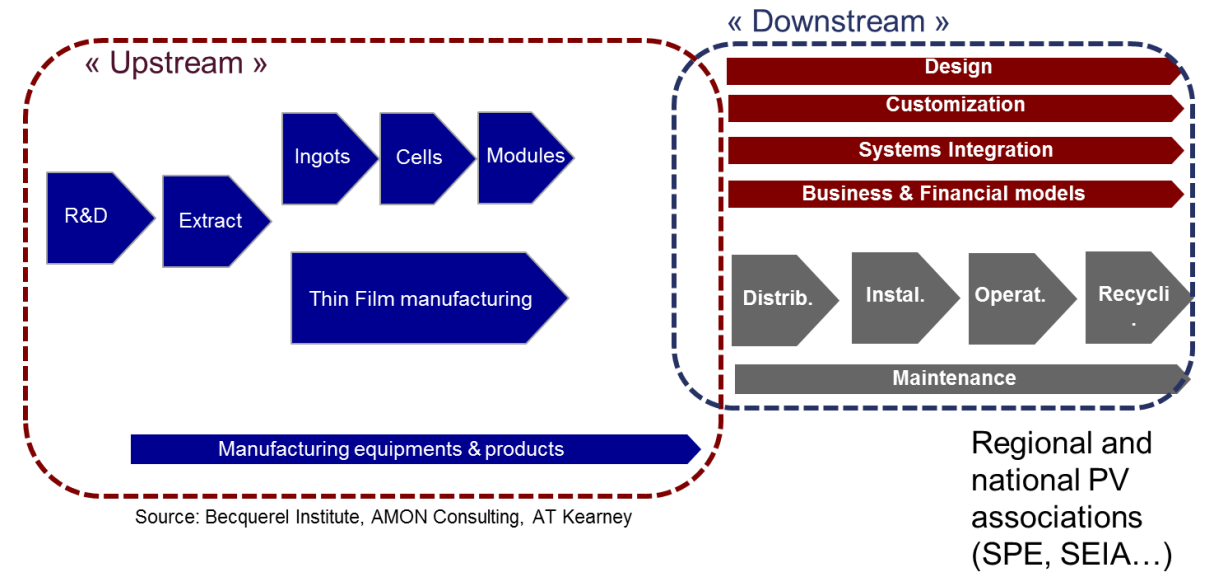


- Three years of work
- 30+ companies involved
- Collaboration with ETIP-PV
- IRENA for dissemination
- Report currently under review
- **« Harmonizing Data Collection from the Field to Improve PV Manufacturing »**

Use of information from various stakeholders and use of dissemination channels once the report is made public.

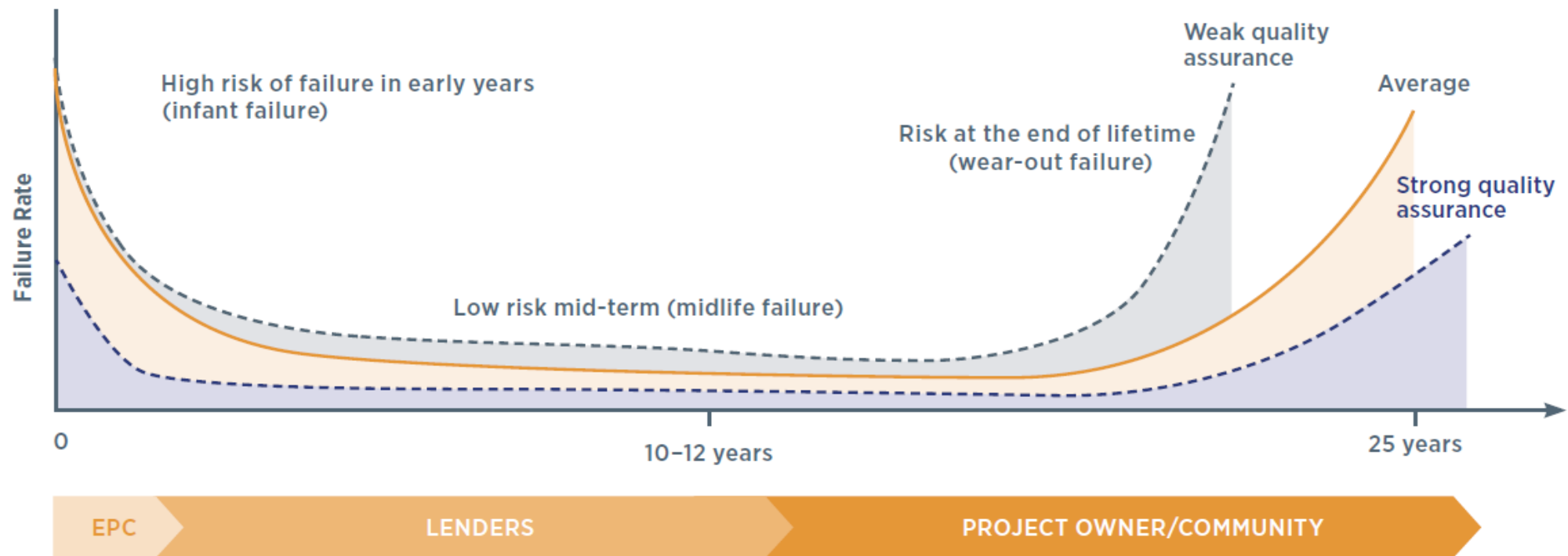
The Quality Challenge

- A fragmented value chain
- Difficulties to identify responsibilities in case of failure
- Warranty exists, but can it solve all problems ?
- Who is responsible? Who pays the bill at the end?
- Who has to act ?



Failures

- Case: My PV plant is losing performances beyond the normal degradation.



Upstream to downstream and back

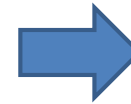
- **Case: My PV plant is losing performances beyond the normal degradation.**
- **Relevant questions:**
 - **O&M company**
 - Has the PV plant been maintained correctly ?
 - **Development company - EPC**
 - Has the PV plant been conceived correctly?
 - **Installation company - EPC**
 - Have the PV products in my PV plant been installed correctly?
 - **Manufacturers of PV products**
 - Were the materials in my PV module or inverter reliable ?
 - Do I know which materials have been used in the PV modules in my PV plant?
 - Have they been treated as recommended?

How it can work in the reality

Some manufacturers produce products of variable quality to save money on quality controls

Some manufacturers don't provide a reliable bill of material (or change materials in the same delivery)

Indication on how to best use products is limited



Development is done using the cheapest products, and no tracking of the components exist.

Tracking defects in the field is not correlated with performance losses.



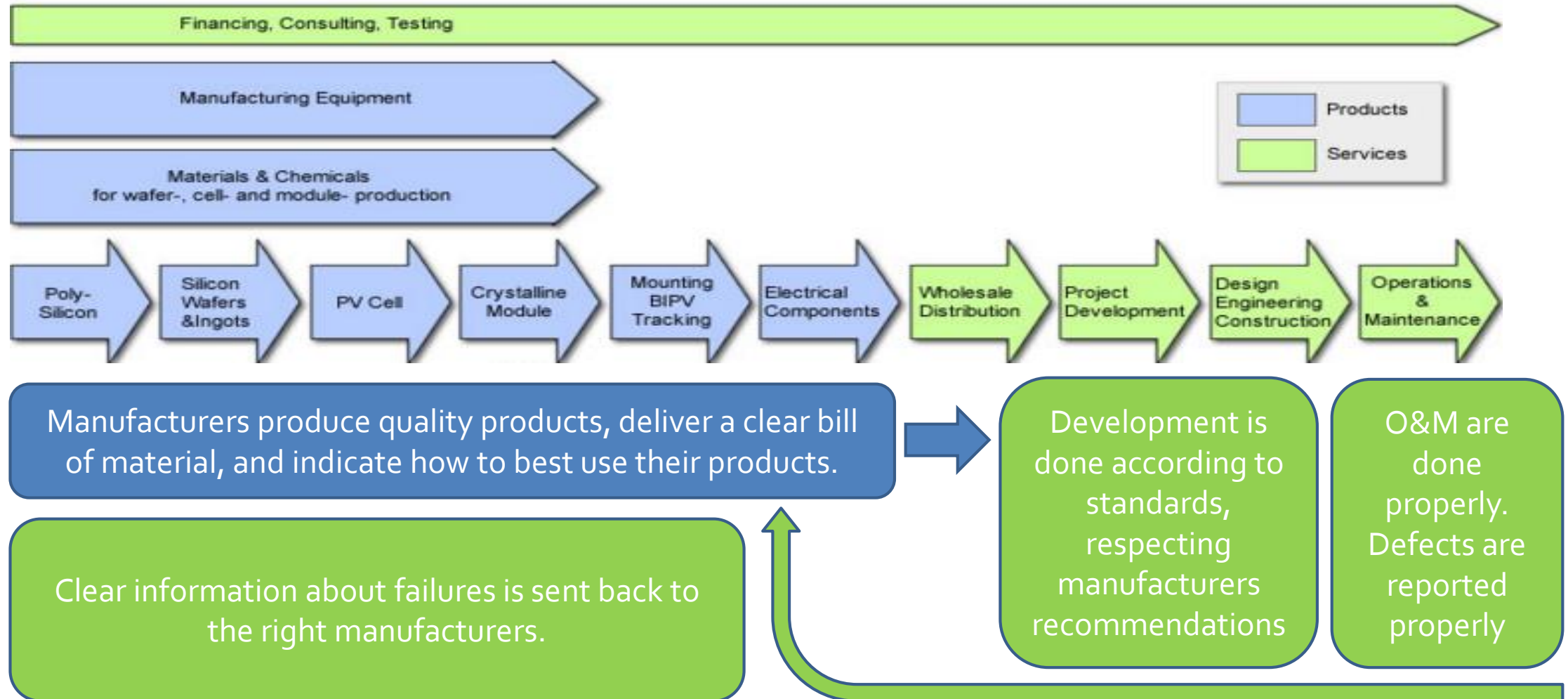
Information is somehow sent back for warranty claims but the reliability of the info doesn't allow to identify the real problem easily



Information about failures is kept secret for commercial reasons.



The ideal case



#1: Activities for better modules

- The industry must improve its manufacturing standards despite the need for competitiveness.
 - Better quality testing on the production line is essential
 - Embedding tests, controls during the production (wafers, cells, modules) reduces the quality risk and therefore reduce the costs.
 - But the manufacturing industry must set up the highest standards for PV quality products .
 - **Industry 4.0 means smart-automation and flexibility, not less controls.**

#2: Activities for better modules

- Manufacturing PV modules is not straightforward
 - Backsheet and EVA should be compatible.
 - Some backsheet technologies require different process
 - Manual operations generate additional risk
 - Using different materials for the same production batch requires tracking
- **Tracability of materials, factory, processes, inline controls are essential**
- **Each module should be accompanied with a real bill of material allowing to trace it. It exists in many industries**

#3: Activities for better plant performance

- O&M requires monitoring
 - failures in the field + Impact on performances
 - And detailed data to connect them together
 - **And identify the root cause.**
- **Communication channel with ALL upstream factors is essential to understand why components are failing.**
- **Independent access to production data and components specs could improve significantly the quality of PV products.**

Next Steps

- Publication of the Solar United report on harmonizing data from the field
- Support to ETIP-PV Quality Working Group
- More activities based on manufacturing 4.0 principles and especially quality promotion at manufacturing level.
- And more

Questions

