Environmental challenges disposing of backsheet at PV module EOL

PVSEC Side Event
PV End-of-life Management: Challenges and Opportunities

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Munich, 21 August 2016
In this discussion

• Coveme and backsheet intro

• Backsheet disposal issues
  • Regulatory aspects
  • Technical aspects
The solar backsheet is the outermost layer in the module with the main purpose of:

- Protecting the module from the environment ensuring
  - Safety
  - Insulation
  - Durability
PV Panels EOL and Backsheet
From GW to Tons of Backsheet

By the end of 2016
~310 GW will be installed

1 GW ≈ 2,500 tons of backsheet

≈ 800,000 Tons of Backsheet in the field by 2016
to gradually take-back

≈ 800,000 Tons of ………plastic?
PV Backsheet
“not just a plastic”

- KPE
  PVDF based (like Kynar)
- TPT, TPE
  Tedlar/PET/Tedlar
  Tedlar/PET/Primer
- Other COATING
  Fluoropolymer coated
- PPE
  PET/PET/primer

*Durashield™ from www.hanitaenergy.com
PV Backsheet – “not just a plastic”

Share of different type of backsheet

10 YEARS AGO
- TPT 85%
- PPE+others 15%

TODAY
- TPT 20%
- TPT+TPE 20%
- KPE 40%
- PPE 30%
- Others 10%
PV Backsheet – “not just a plastic”

Share of different type of backsheets

10 YEARS AGO

- TPT: 85%
- PPE+others: 15%

TODAY F VS F-FREE

- Fluorine containing
- Fluorine free
PV Backsheet – “not just a plastic”

Share of different type of backsheet per different production areas

CHINA

JAPAN

EUROPE

Fluorine containing

Fluoro free
Coveme’s strategy

**Scientific Approach**
- Gather scientific data on costs and challenges in PV module recycling
- Increase the general consciousness on sustainability

**Institutional Approach**
- Understand the current and coming legislation
- Work with institutional players involved in set-up of directives and regulations (e.g., Ecodesign)
# Institutional Approach

Understanding regulations and their implication for backsheet

## The impact of backsheet

- The nature of the backsheet (it’s composition) influences the way it can be recycled.
  - Different materials = different cost
  - Different restrictions

- Environmental impact of the PV modules should consider this
Scientific Approach

Disposing methods are strongly influenced by the chemistry of materials involved in the backsheet. (i.e. the presence of halogens)

Different backsheet have different impact on this processes, especially in respect of efficency and environmental issues.
Recycling bodies to find a way to take back the backsheets
- Module manufacturer to use recyclable materials (like PET)
- Halogen (Fluor) free materials cannot be pyrolysed
- Caution when burning Fluoro materials for toxic emission

Backsheet disposal path

- Recycling
- Backsheet Recycling
- Landfill
- Energy Recovery
- Incineration
- Pyrolysis

Risk of toxic emission with fluoride materials

Only for PET based materials
SUMMARY (1)

- Treating PV backsheets when recycling modules means dealing with many different kinds of polymers. With very different implications in terms of COST and ENVIRONMENTAL ASPECT.

- Existing and new regulations shall take into account these differences.

- Different disposing costs, environmental aspects, shall drive companies when designing and installing PV modules with different backsheets.
Today a BACKSHEET IS A NOT RECYCLABLE item
- importance to define new process for recycling all the parts in a PV module
- strong importance to minimize the environmental impact of its disposal
  (Fluorurate very impactant!)
Thanks to everyone would like to cooperate

Thanks to you for the attention

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