

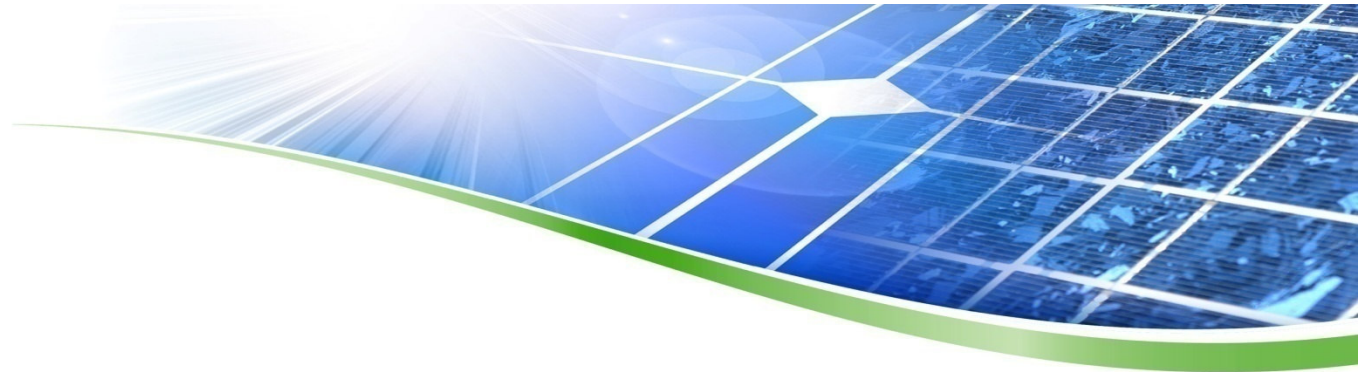


Making the Photovoltaic Industry

‘Double Green’



EUROPEAN ASSOCIATION FOR VOLUNTARY TAKE BACK AND RECYCLING OF PHOTOVOLTAIC MODULES



MAKING THE PHOTOVOLTAIC INDUSTRY 'DOUBLE GREEN'

PV CYCLE: A Voluntary Take-Back and Recycling Scheme for EoL PV modules

Presentation European Economic and Social Committee

Jan Clyncke

PV CYCLE

30 June 2009, Domaine Provincial de Chevetogne



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- **Mission, Objective and Strategy**
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Introducing PV Cycle

Who We Are:

- **Founded in July 2007**
- **Established and staffed office in Brussels in April 2008**
- **Today representing around 70% of European PV market**



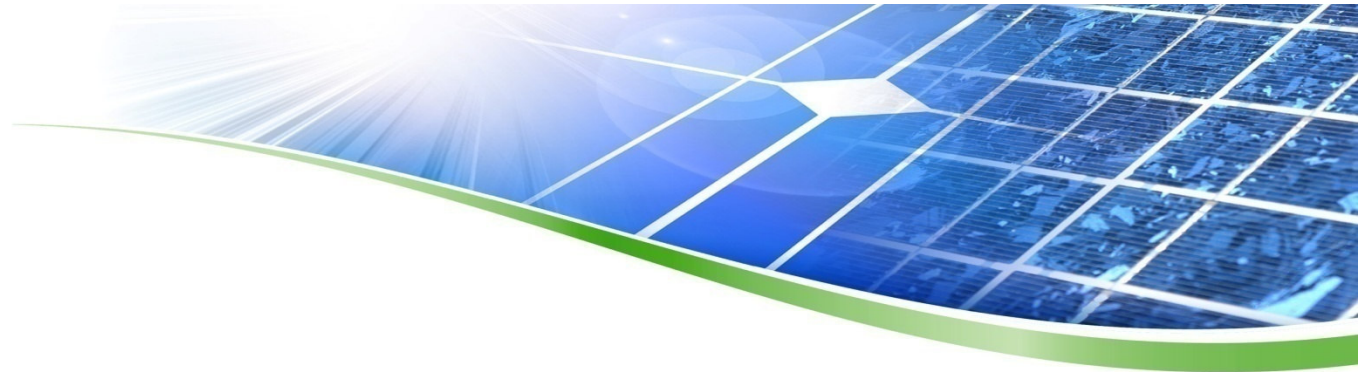
Mission

Strive to map all end-of-life photovoltaic modules and to stimulate their collection and recycling.



Objective

To assume, without profit, the responsibility of the voluntary take-back and treatment of the EOL-modules in all members states of the European Union and the European Free Trade Area based upon the environmental agreement with the European Union.



Strategy

PV CYCLE obtains the objective by:

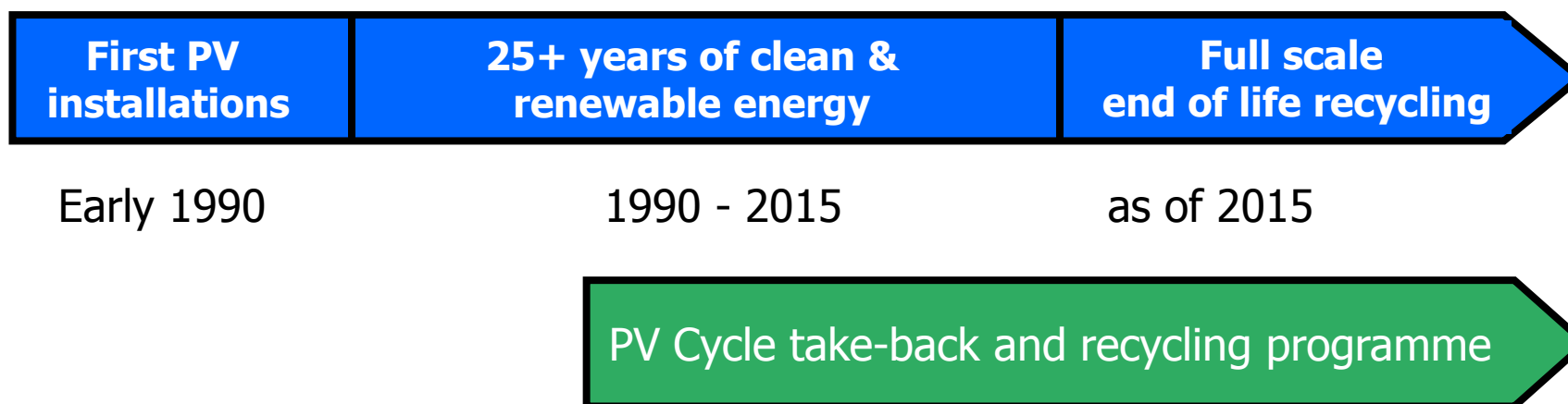
- **In the name of their members organizing the collection and treatment of EOL-modules as described in the Environmental Agreement.**
- **In the name of their members meeting the needs of the reporting obligation as described in the Environmental Agreement.**
- **In the name of their members representing as spokesperson of the local, the national and the European authorities and third parties.**



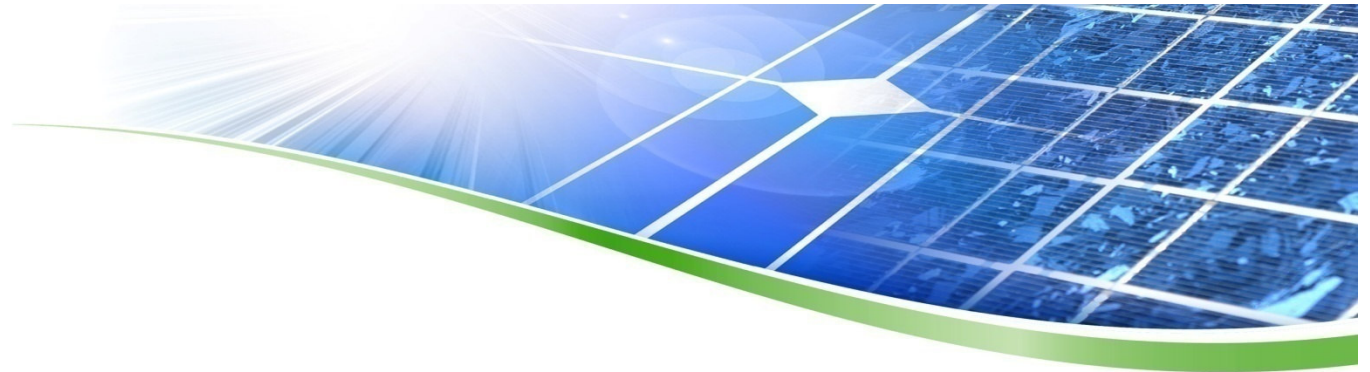
Ahead of time

"The industry is strongly committed to act today ahead of the first large scale series of end-of-life modules"

Karsten Wambach, PV CYCLE President



Offering a truly sustainable energy solution today to help prevent climate change tomorrow



PV Cycle Circle

Generating energy



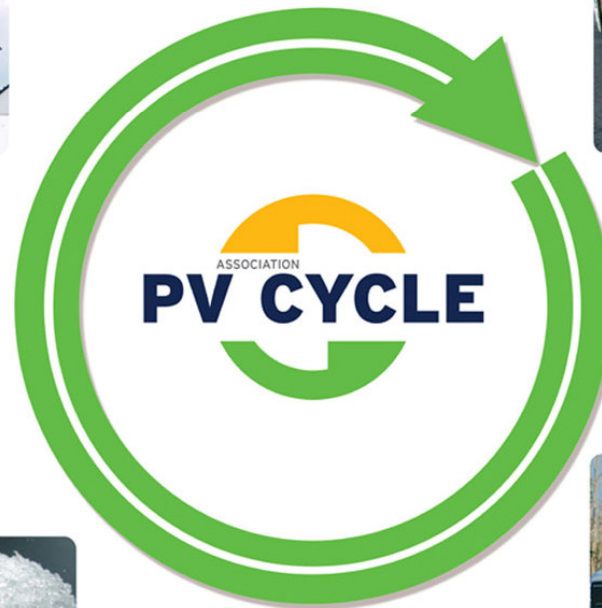
End-of-Life



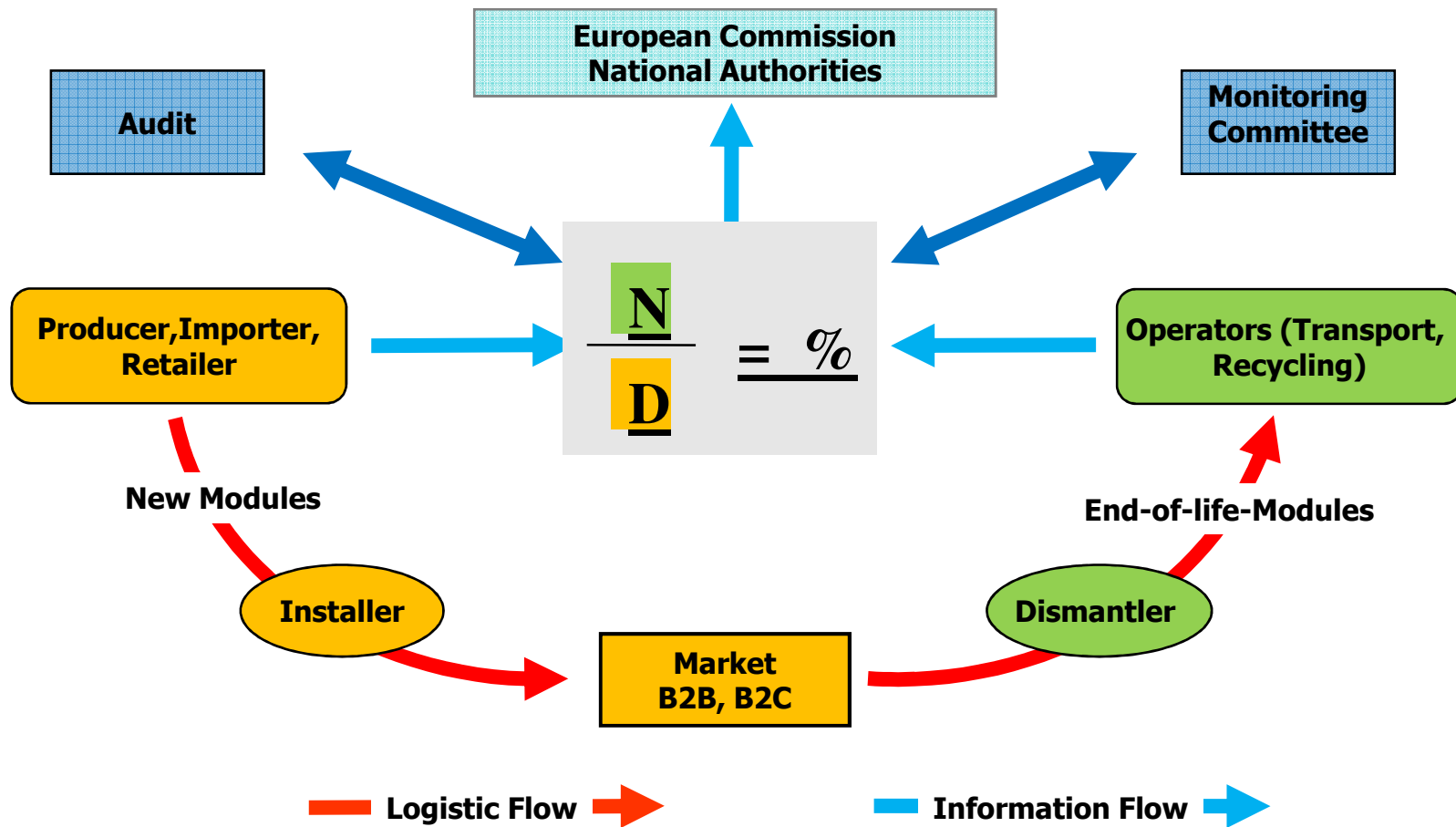
Recycling



Collection



PV Cycle Network



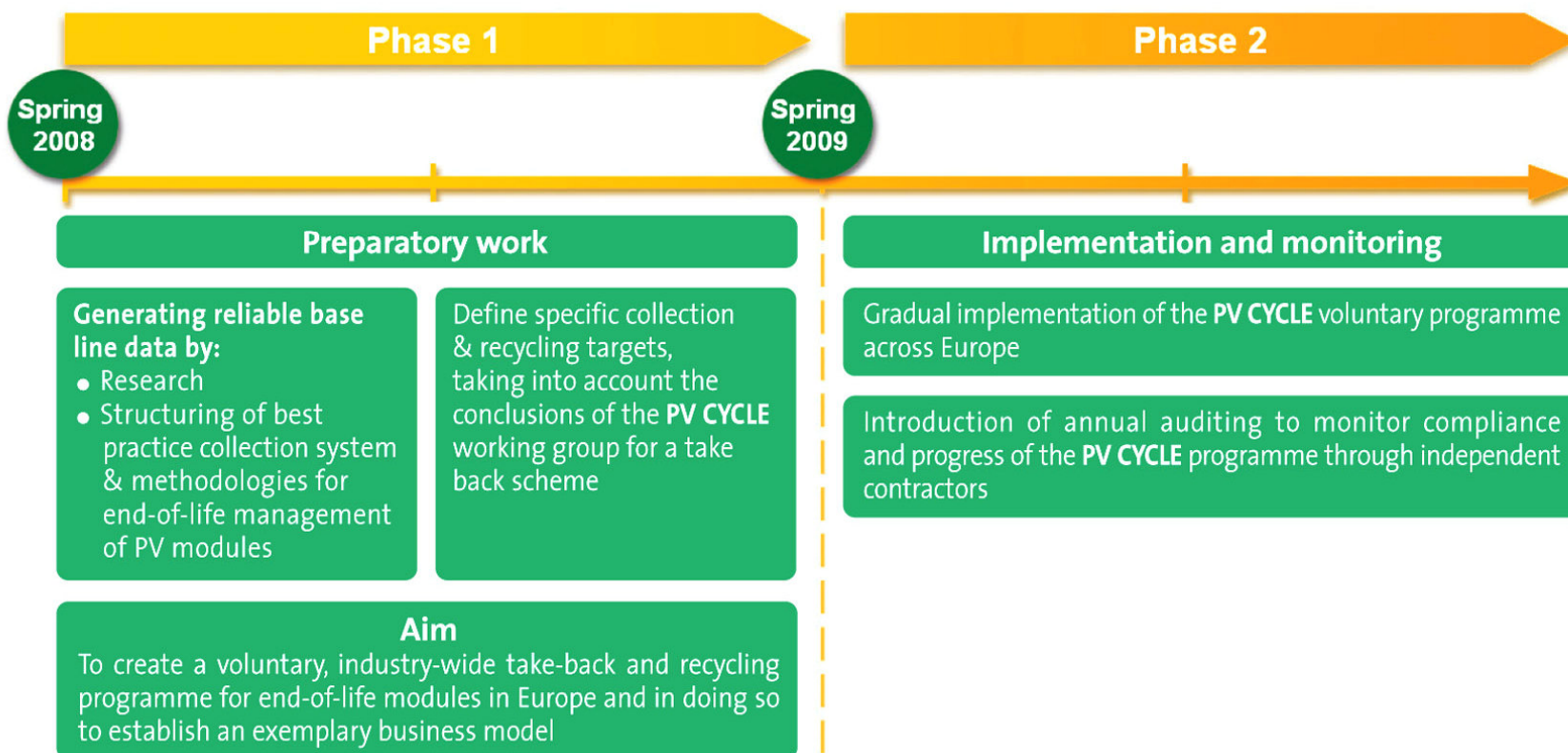


Status of activities

- **Two-phase programme**
- **Activities 2008**
- **Current activities**

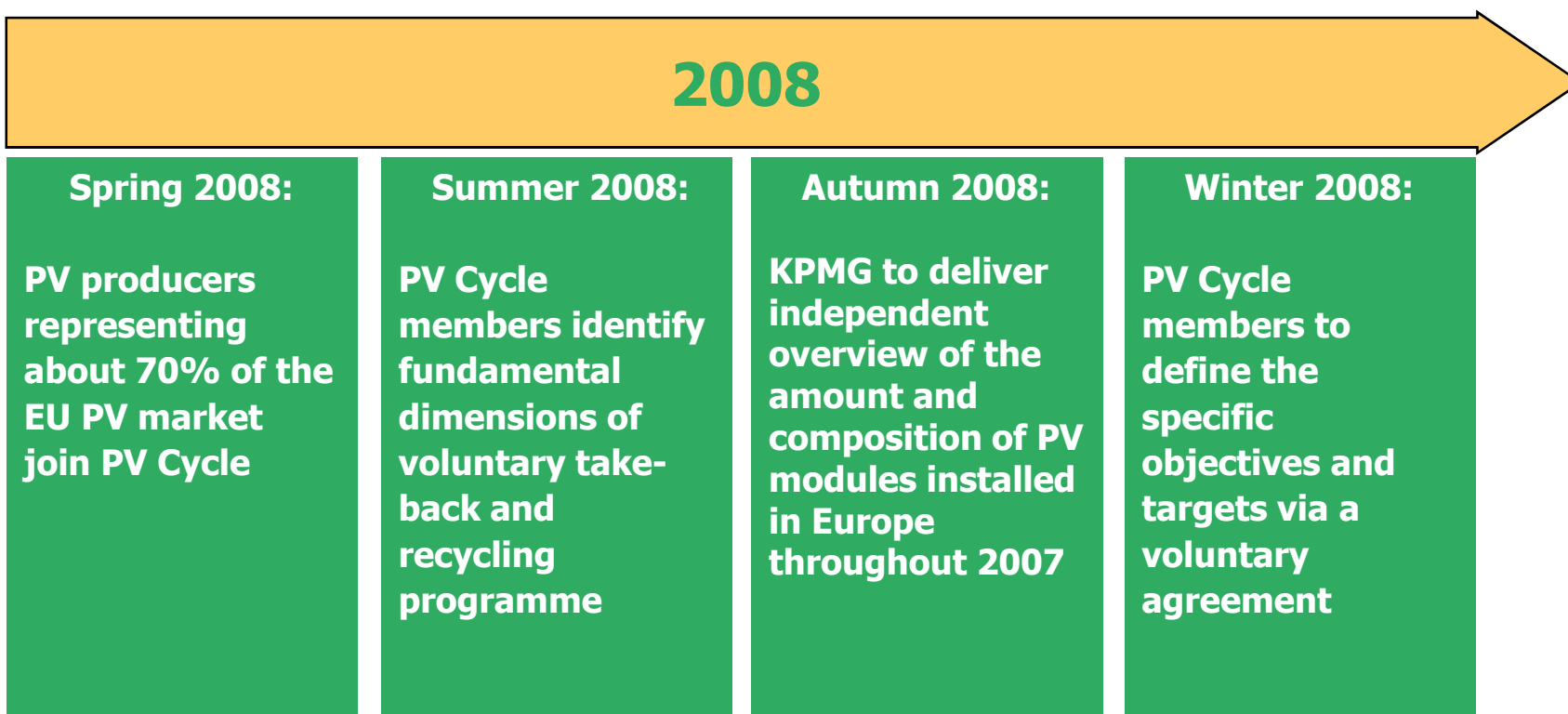


PV Cycle two-phase programme





Phase 1



Activities 2008

I. PV CYCLE Study

II. New English Website in July:

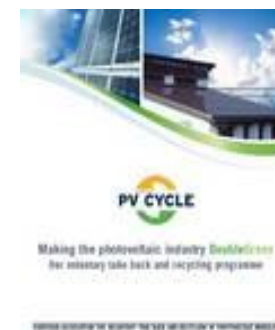
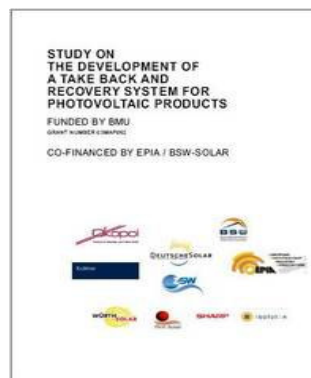
www.pvcycle.org

III. First Market Research & RfQ concerning adequate Service Providers for Collection in Germany (May 2008)

IV. New brochure PV CYCLE EN – 1 September 2008

V. Brochure PV CYCLE DE – 15 October 2008

VI. Data Declaration by members in cooperation with KPMG to determine the Denominator (D)





Activities 2008 (2)

VII. Meeting European Commission

VIII. Meeting BundesMinisterium Umwelt and Umweltbundesamt

IX. Executive search for new members

X. Preparatory work: Key Questions, identifying approaches, drafting concepts, defining system boundaries

XI. Start of the Working Group „Take-Back & Recycling Scheme“

XII. First Newsletter - October 2008



Activities 2008 (3) – Working Group

- **Meetings 2008**
 - 16 – 17 September
 - 9 – 10 October
 - 5 – 6 November
 - 10 – 11 December
 - **Meetings 2009**
 - 20 January
 - 12 February
 - 17 March
 - 30 April
-
- Long-form report
 - Results of the Workgroup
 - Take-Back & Recycling Scheme (TB&RS)

Conclusions → PV CYCLE Take-Back & Recycling Scheme



Activities 2008 (4) – Declaration Europe & PV CYCLE

19th December 2008

Declaration signed by the Members of PV CYCLE with the support of European Commissioner Mr. S. Dimas and the President of the European Council, French Minister of Environment Mr. J-L Borloo.



Promise to conclude a Environmental Agreement and open the discussions with the European Union by April 09.



Guiding benchmarks :

- 65% collection target
- 85% recycling target
- free of charge



Voluntary Agreement – PV CYCLE & Europe

Benchmark criteria for deciding Community interest

- **Compatibility with Community environmental policy:**
e.g.Environmental Action Plans
- **Cost-effectiveness of administration (Commission side)**
- **Representativeness:**
%wise (EU, not global) and also organised.
- **Quantified and staged objectives ;**
long periods possible but only if interim and clear targets
- **Involvement of civil society**
- **Monitoring and reporting : independent verification**
- **Sustainability: not just environmental protection, also economic and social dimension.**



Current activities

I. Finalizing PV CYCLE Take-Back & Recycling Scheme

- Logistics
- Data Declaration
- Recycling
- Costs & Financing

II. New German website – February 2009 – www.pvcycle.de

III. Finalizing draft Environmental Agreement

IV. Dismantling and Recycling of the Chevetogne (BE) PV Generator

Build in 1983

Out of order since 2003

2.000 EOL-modules



Pellworm Generator (DE)



Pellworm Generator – Positive result

By using recycled wafers only 1/3 of the energy needed to produce a module of completely new material is required.

The energy return time at the same power is at 30 % of a new product.

- Production of wafers, cells, modules : 459 kWh**
- Recycling, processing of cells, fabrication of modules: 196 kWh**





Today's PV Recycling Processes

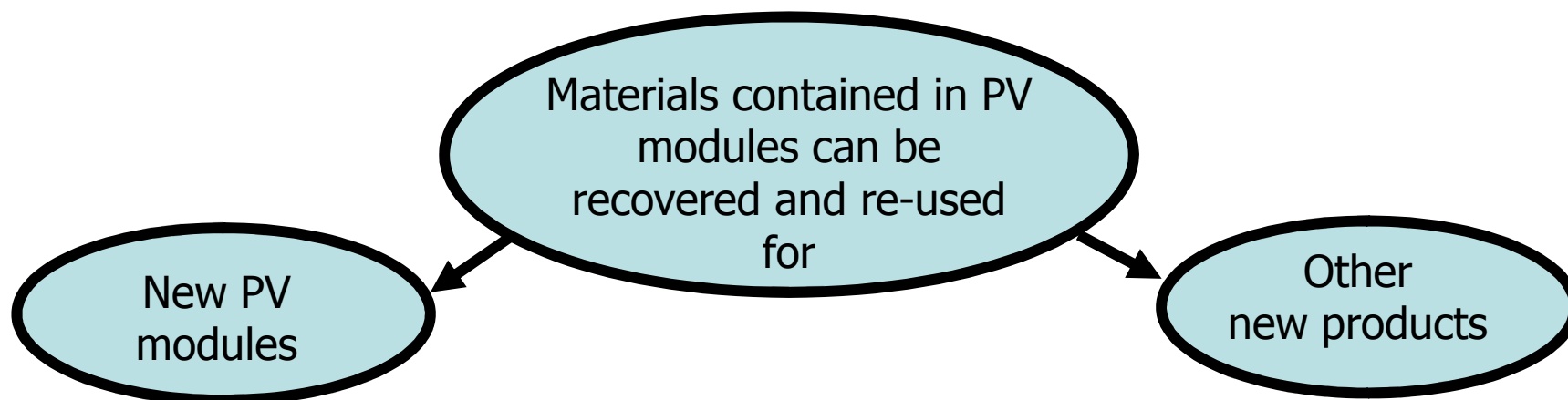


Thin-Film Recycling Process



Silicon Recycling Process

“Double use” of PV modules



End-of-Life- PV-Module



Recycling Process



Silicon



Glass



Membership

**2007 : 6 Founding member-companies
2 Founding member-associations**

2007 : 13 New Members

2008 : 8 New Members

2009 : 14 New Members

36 Full members

7 Associated members



Members 2008



EUROPEAN ASSOCIATION FOR VOLUNTARY TAKE BACK AND RECYCLING OF PHOTOVOLTAIC MODULES



New Members 2009



New Associate Member 2009





Thank you for your attention!



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