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SOLARPOWER SUMMIT 2025
WELCOME TO THE SOLAR FLEX ERA

FLEX

**POWERING EUROPE'S
FUTURE:
SOLAR, FLEXIBILITY,
AND INDUSTRIAL
COMPETITIVENESS**



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SPEAKERS



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ALEXANDER WIELGOS

Policy Officer for the WEEE review,
DG ENV, European Commission

WEEE legislation: current status, implementation and future outlook

SolarPower Summit 2025
Wednesday 26 March 2025



Alexander Wielgos

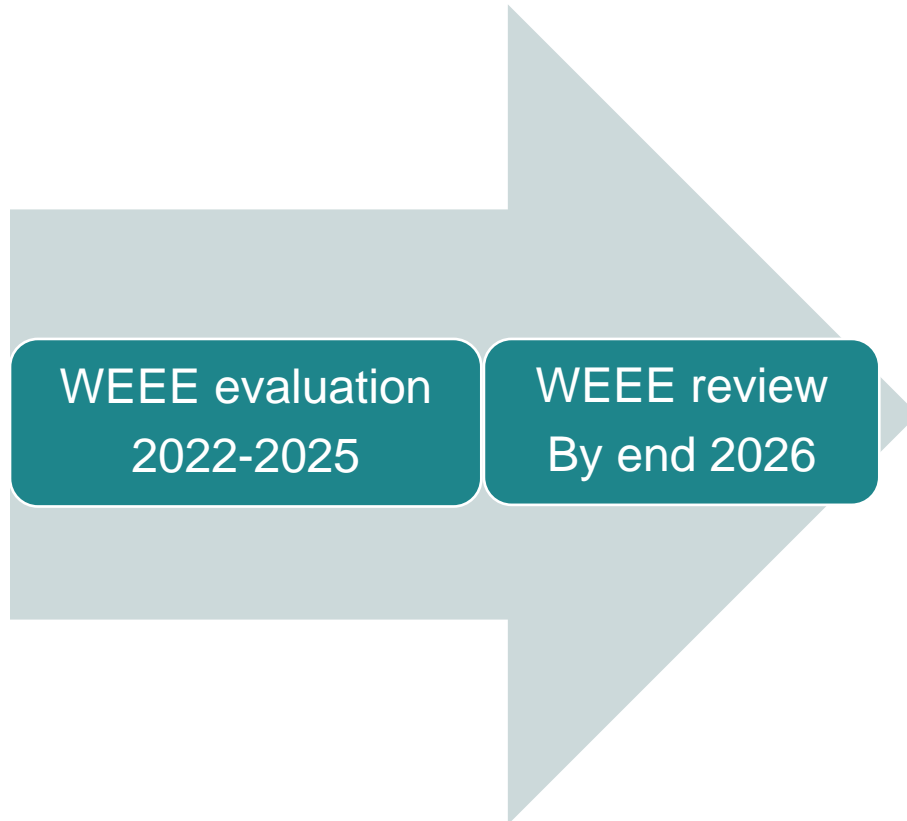
Unit B3: From Waste to Resources
DG ENVIRONMENT
European Commission

Evaluation of the WEEE Directive: Overview

□ Purpose and scope:

- **5 evaluation criteria:** effectiveness, efficiency, relevance, coherence and EU added value
- Some issues the evaluation is addressing:
 - WEEE is one of the fastest growing waste streams in Europe- waste prevention and reuse;
 - the WEEE collection is unsatisfactory- it needs to be significantly increased (doubled);
 - WEEE contains precious and critical raw materials the recovery of which is significant for the circular economy.
- Help the Commission determine whether a review is needed.

WEEE Directive evaluation&review



- On average, only **40%** of WEEE is recycled in the EU
- Current input-based, non-material specific **recycling targets** do not foster the recovery of secondary raw materials
- Only about **23%** of recycling facilities implement high quality **standards** for the treatment of WEEE
- Challenges with **collection and transport conditions** hinder proper treatment
- Still about one quarter of WEEE **leaving the EU uncontrolled**

Timeline

Directive 2012/19/EU on
waste electrical and electronic equipment (WEEE)

WEEE evaluation
2022-2025

WEEE review
By end 2026

**Targeted
amendment of
WEEE Directive -
Directive (EU)
2024/884 of 13
March 2024**

Commitments in relation to WEEE: Targeted amendment of WEEE Directive

- ❑ **Directive (EU) 2024/884** of 13 March 2024 amending the WEEE Directive (targeted amendment of the WEEE Directive following the judgement of the Court of Justice):
 - **Review the WEEE Directive**: No later than **31 December 2026**, the Commission shall assess the need for a revision of this Directive and, where appropriate, present a **legislative proposal** in that respect, **accompanied by a thorough socio-economic and environmental impact assessment**.
 - **Impact assessment** to consider the need for :
 - Legal certainty – no retroactive effect in any Member State
 - Implementation of waste hierarchy
 - No disproportionate costs to citizens and consumers, in line with “polluter pays” principle
 - Full implementation and enforcement: adequate collection targets and prevention of WEEE illegal trade
 - New EEE category for PV panels and collection targets taking into consideration expected lifetime
 - Mechanism to ensure producers’ compliance

Commitments in relation to WEEE: **Critical Raw Materials Communication and Act:**

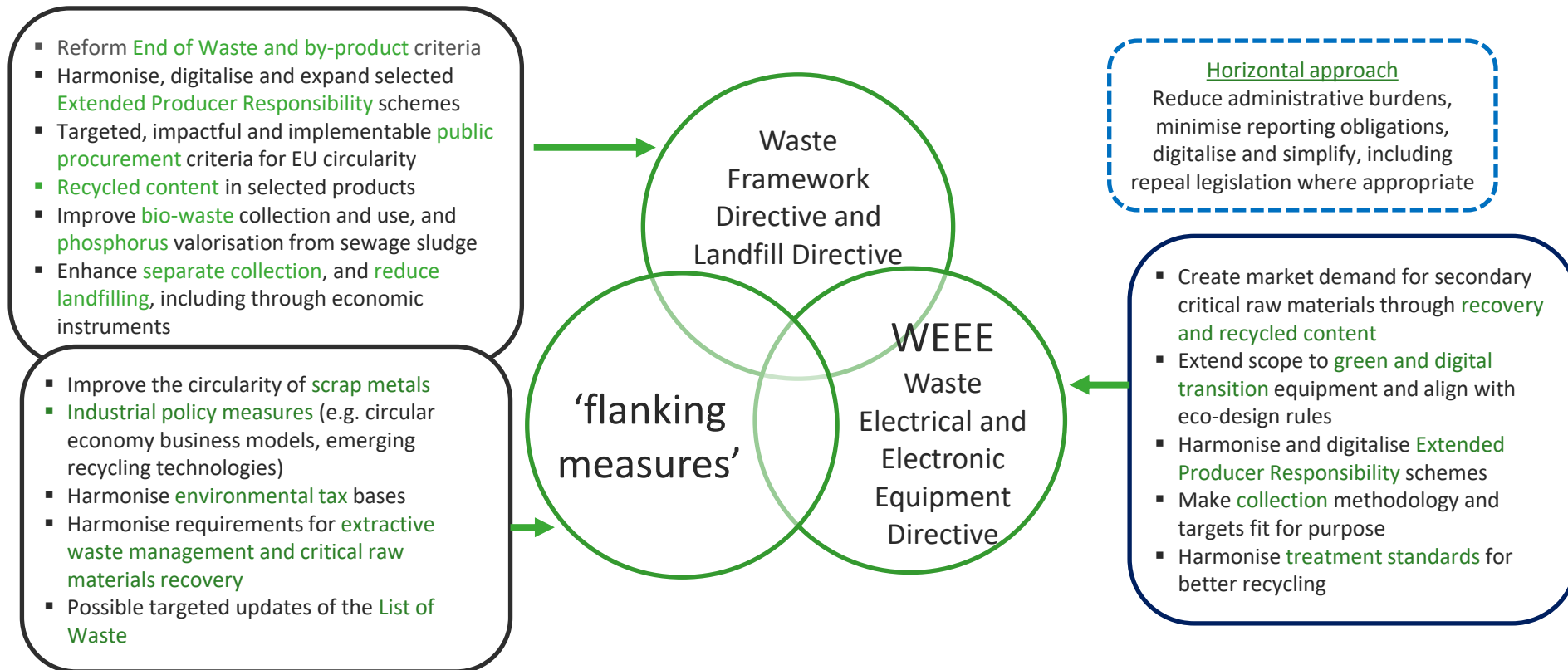
➤ **COM:**

- **Review** the WEEE Directive to, *inter alia*, **address CRM-rich equipment** in provisions relating to **information requirements** and **recovery targets**.
- Provide **recommendations** to Member States on measures targeting **small and CRM-rich consumer electronics**, to improve the **return and take-back** of used and waste mobile phones, tablets and laptops.

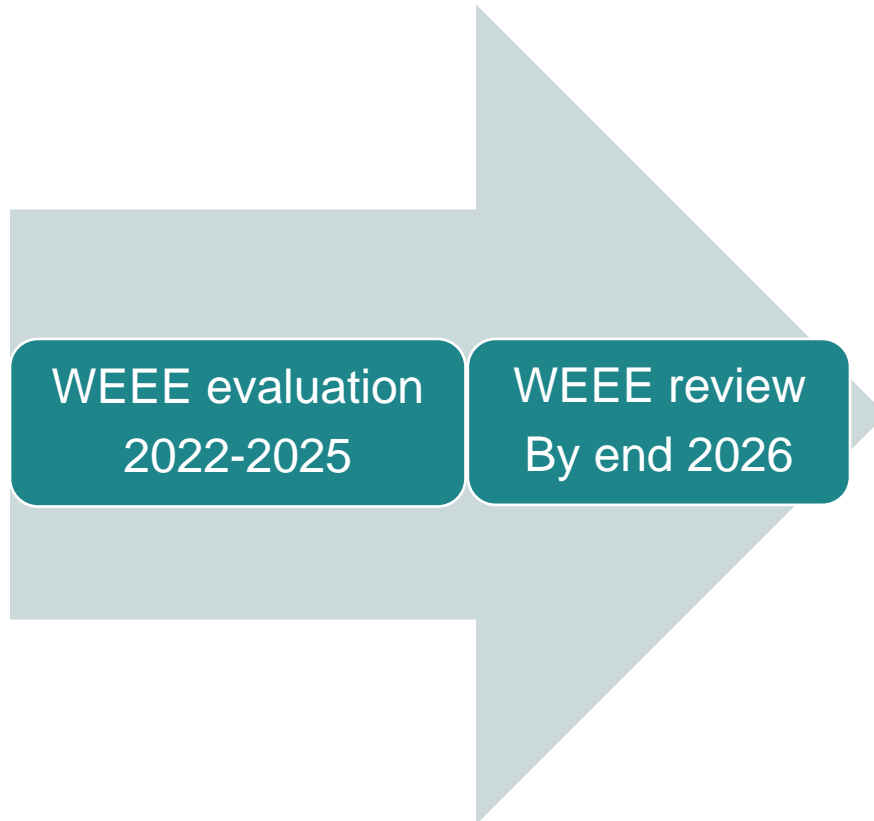
➤ **CRM Act:**

- WEEE identified as a waste stream with significant **CRM recovery potential** to contribute to EU recycling capacity targets.

Circular Economy Act – three possible pillars

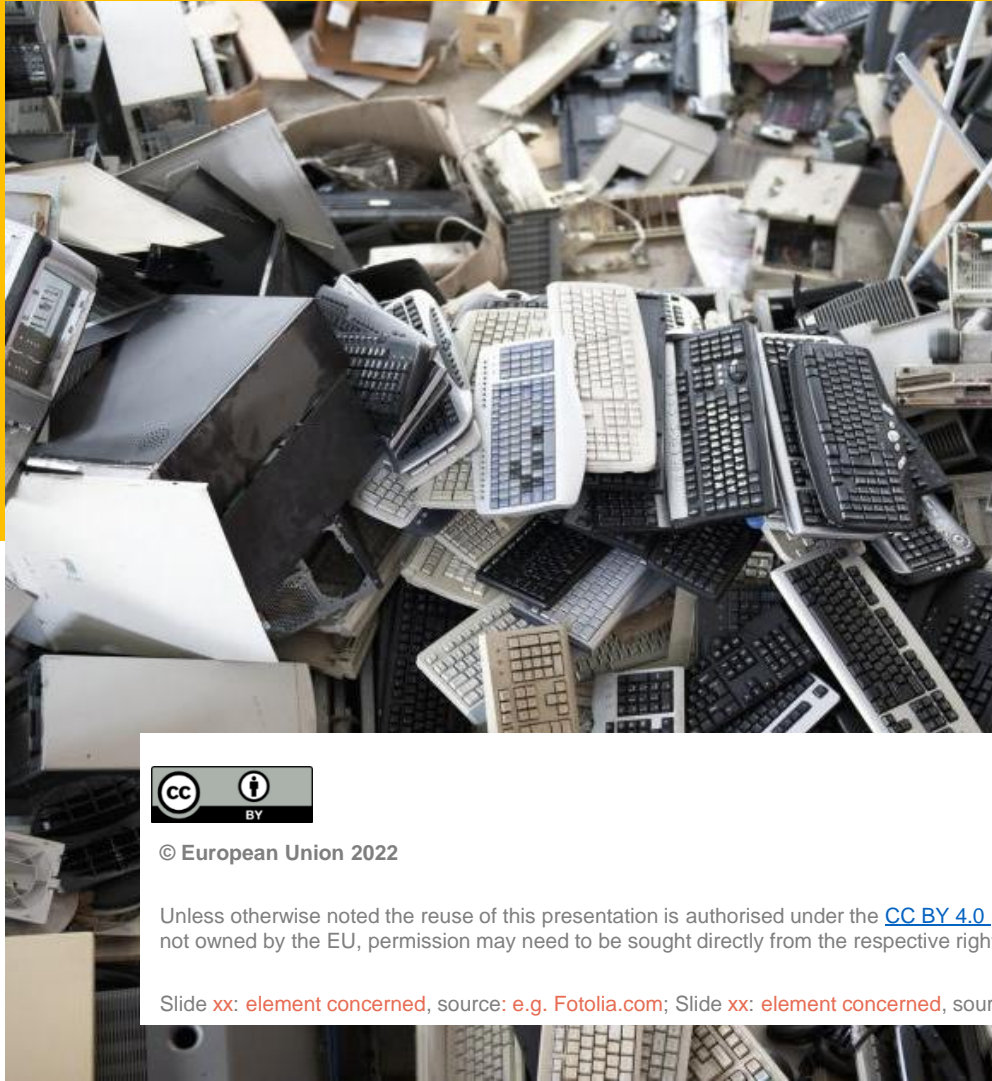


Toward a CEA - WEEE



4 main challenges:

- Collection
- Recovery of CRMs
- **Extended Producer Responsibility**
- Treatment



Thank you

European Commission
Directorate-General ENVIRONMENT
Directorate B – Competitive Circular
Economy & Clean Industrial Deal
ENV.B.3 – From Waste to Resources



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CLAIRE AGRAFFEIL

EU Project Coordination,
CEA-INES



PV EoL management & recycling

Claire Agraffeil



R&D platform



to boost innovation for industrial transfer



& to think circular



Since 2011, >€50M invested,
LabFab@INES : ~€30M ongoing investment

Moving forward High-value recycling

Delamination technologies

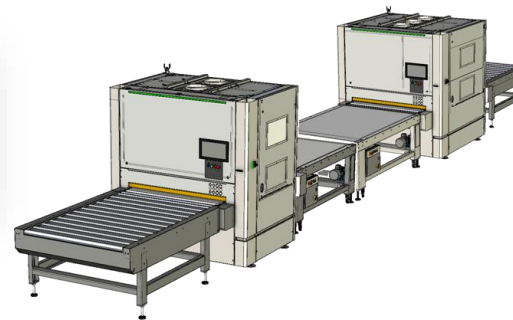
Scale-up from TRL 5 to TRL7 → technological transfer for Industry



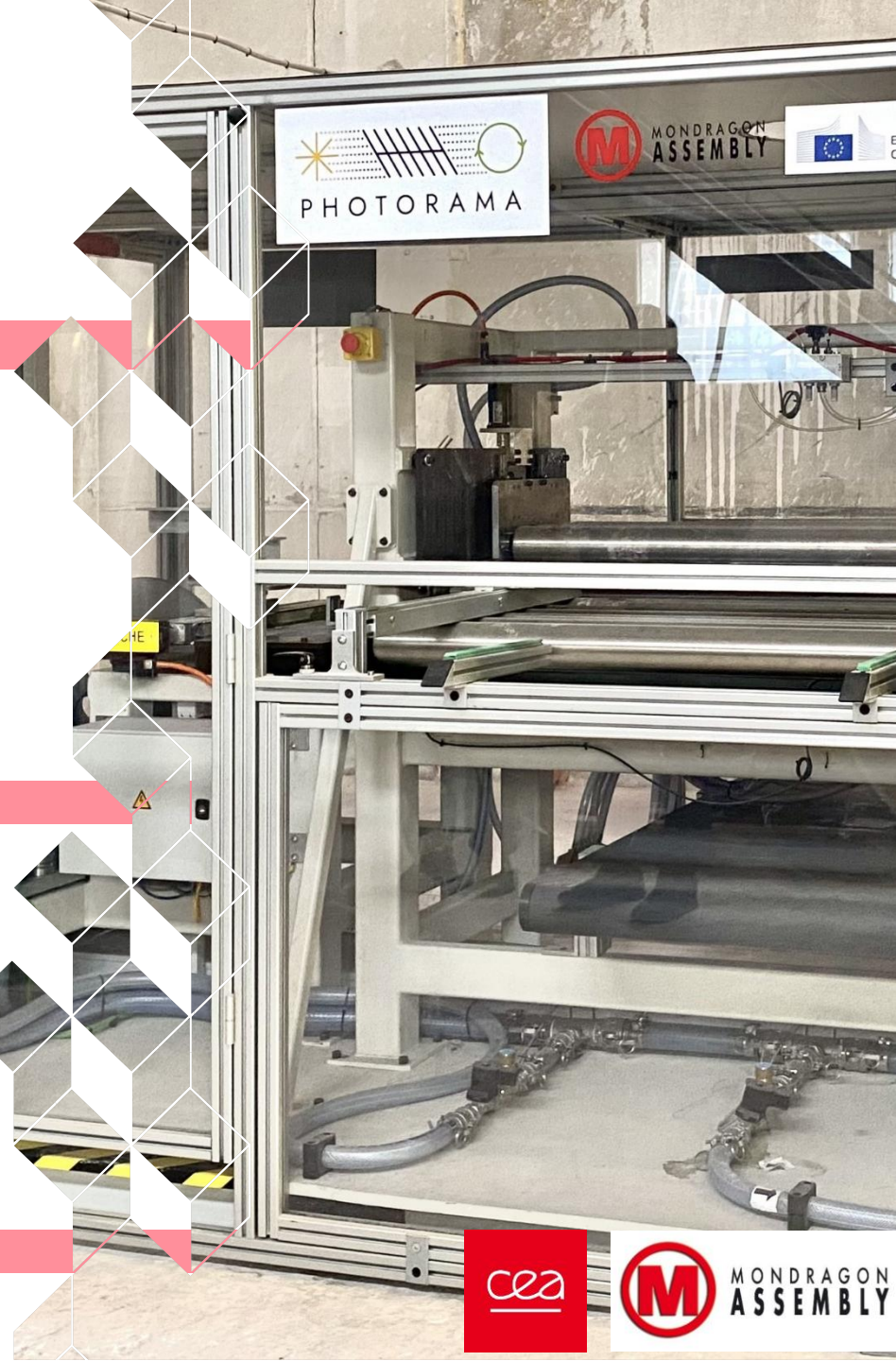
Winner of the Innovation Awards
EUSEW2024



Technology based on
diamond wire cutting

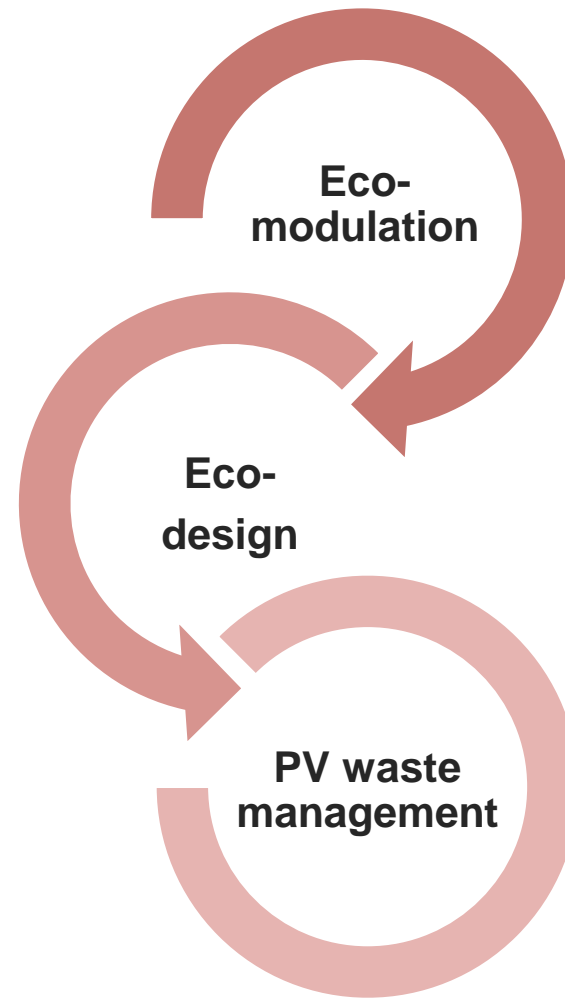


Technology based on
grinding from rear side





Fostering progress & circularity Development



- EPR French model fee modulation system

- Recyclability Index
- Ecodesign database

- Methodology for standardization
- PV waste management in France



Visual test



Repair



Electroluminescence test



Flash test



Safety test by wet leakage

Module monitoring
and diagnostics



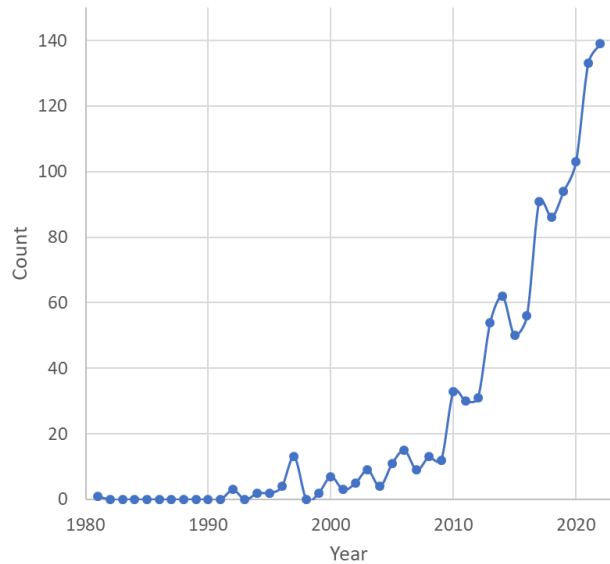
Exclusive repair
techniques to
maximise re-use

R&D status in PV recycling

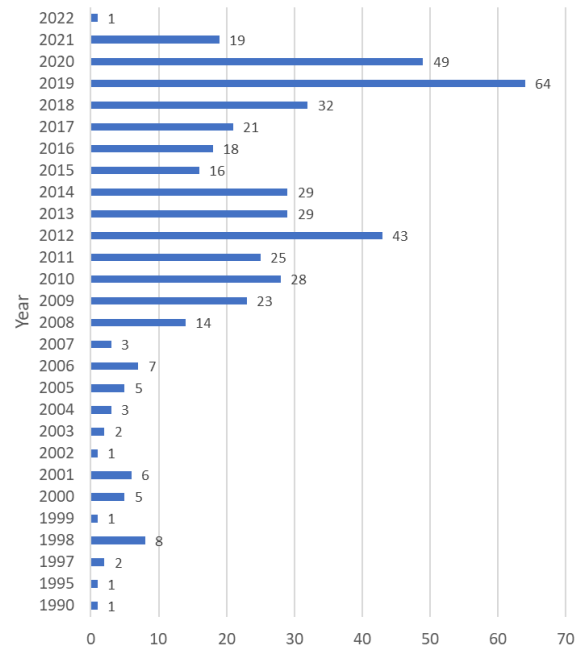


Trends in R&D development

Scientific publications



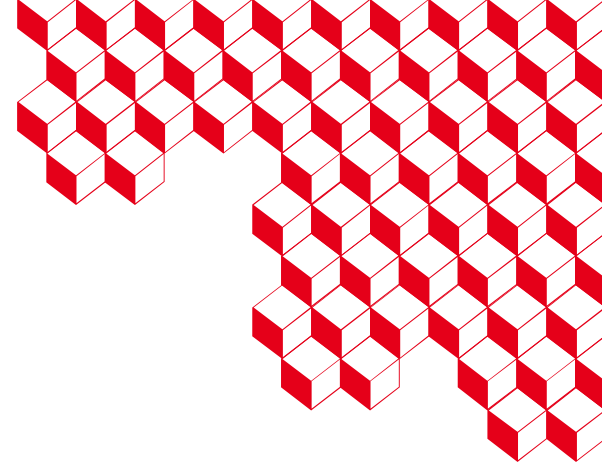
Patent applications



Industry development

> 170 companies identified in 2024
including > 40 recyclers in EU/ Schengen area





Thank you



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MICHAEL KOEBELE

Compliance Director,
JA Solar

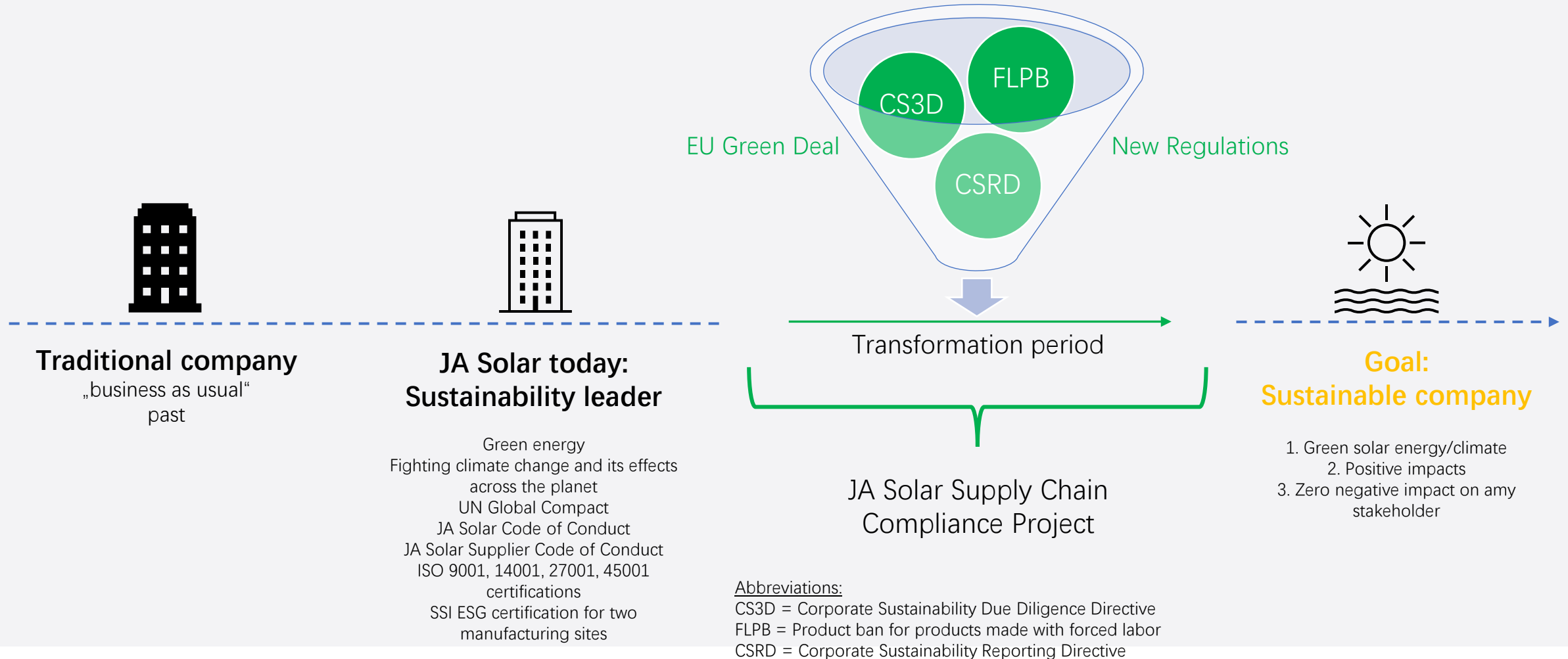
An innovation update on end-of-life and recycling practices

COMPLIANCE &
ESG

26.03.2025

WWW.JASOLAR.COM



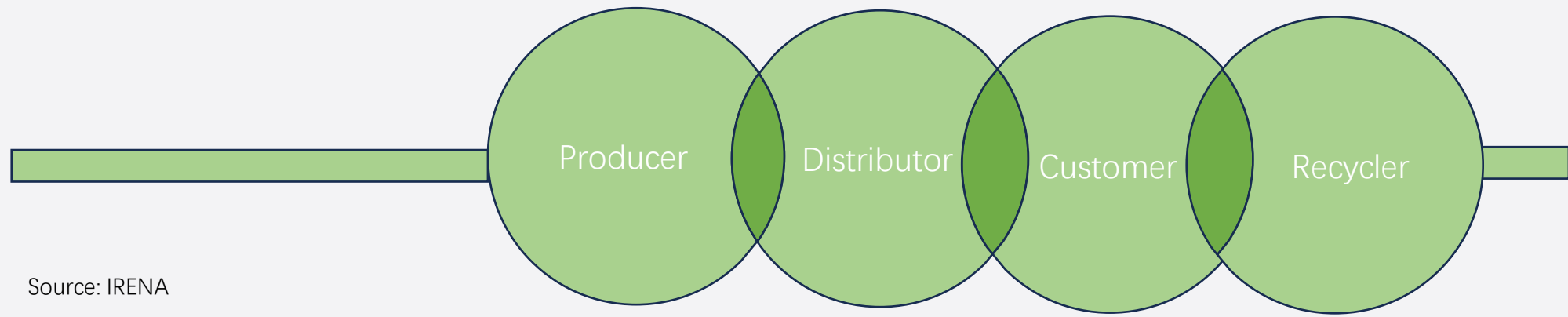
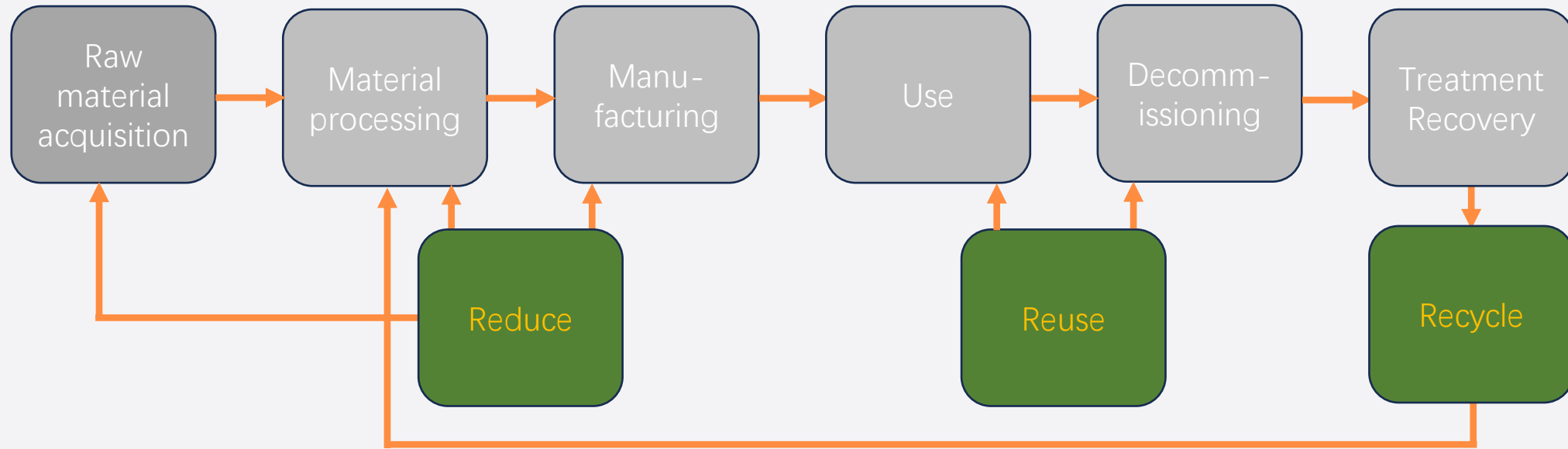




REDUCE

REUSE

RECYCLE



Source: IRENA



Eco-friendly raw materials

Committed to promoting the use of green raw materials, in the product design and production process, give priority to the selection of recyclable, low-carbon and environmentally friendly materials, such as **recycled silicon, halogen-free encapsulation materials**, etc., while the module products of all materials have been certified for **RoHS & REACH compliance**.

Product design

At the design stage, JA considers recycling from the product end, introducing **new composite frame materials of glass fiber reinforced polyurethane, 100% recycling of packaging materials**, and developing green materials such as **low-acid adhesive films**.



Manufacturing phase

Apply cleaner production technologies, adopt more efficient and less energy-consuming equipment, focus on lean production, optimize the use of materials, and adopt waste classification and management, e.g., reuse of **adhesive film tailings, recycling of fluxes**, etc.

Product Recycling

As a **member of PV CYCLE**, we have actively fulfilled our responsibilities through the Compliance and Take Back Scheme, and invested in a **recycling line in a factory in China** in which recycling becomes a permanent operation for the efficient dismantling and recycling of PV modules by the end of this year.

Dr. Michael Koebele
Director
Compliance & ESG
michaelkoebele@jasolar.eu

Harvest the Sunshine

Premium Cells, Premium Modules

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SIMON PRÜLLER

CEO,
2ndCycle

Redefining PV Module Lifecycle

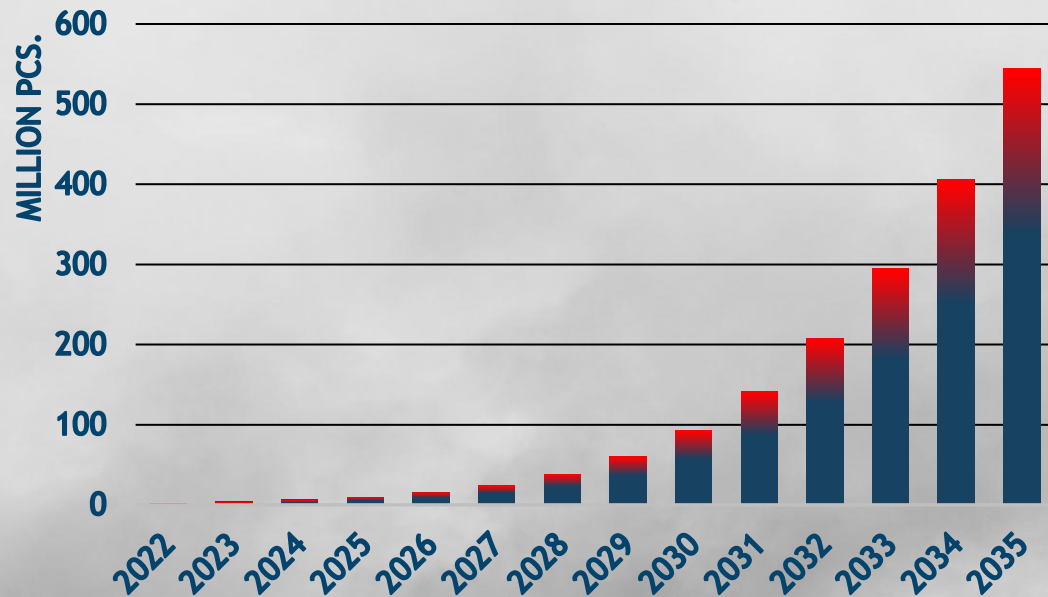
Automated Reuse & Recycling for PV Modules

DI Simon Prüller, CEO & Co-Founder



Exponential increase in used PV modules: our technology turns a growing problem into an opportunity

Forecast for the global return of PV modules



- The majority of dismantled PV modules are in the middle of their life cycle and are still fully functional -> Repowering, ROI

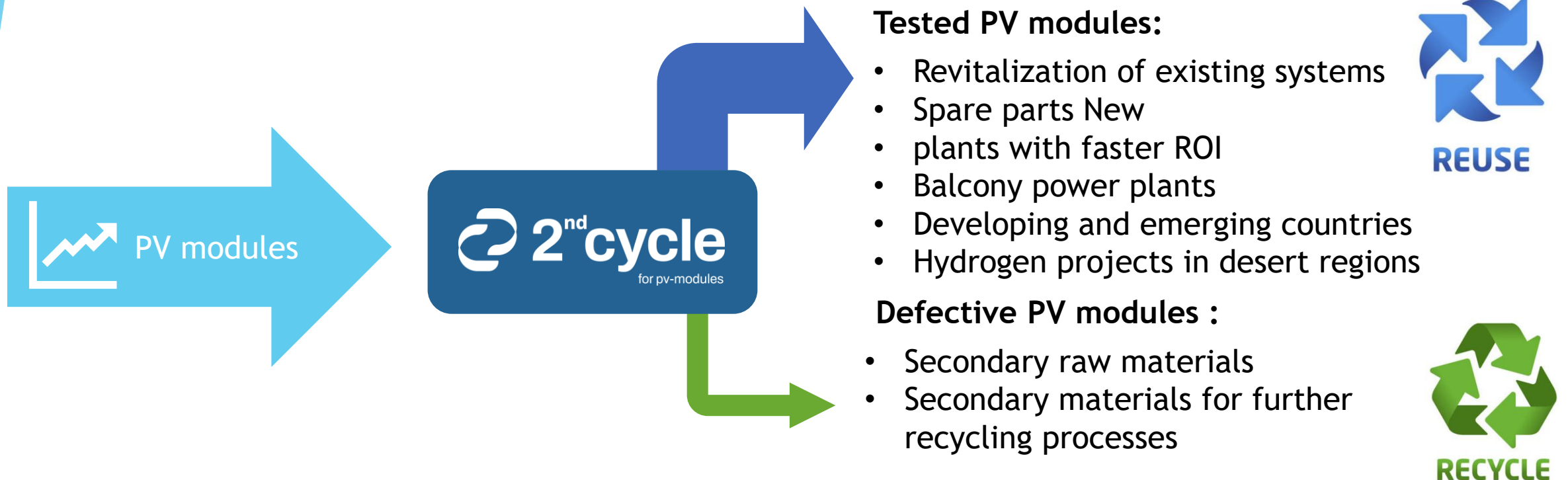
- Lack of economic processes for reuse and recycling

- This results in very high costs -> potential added value through reuse is lost

- The majority of PV modules are exported illegally and end up in landfills or are downcycled and thermally recycled

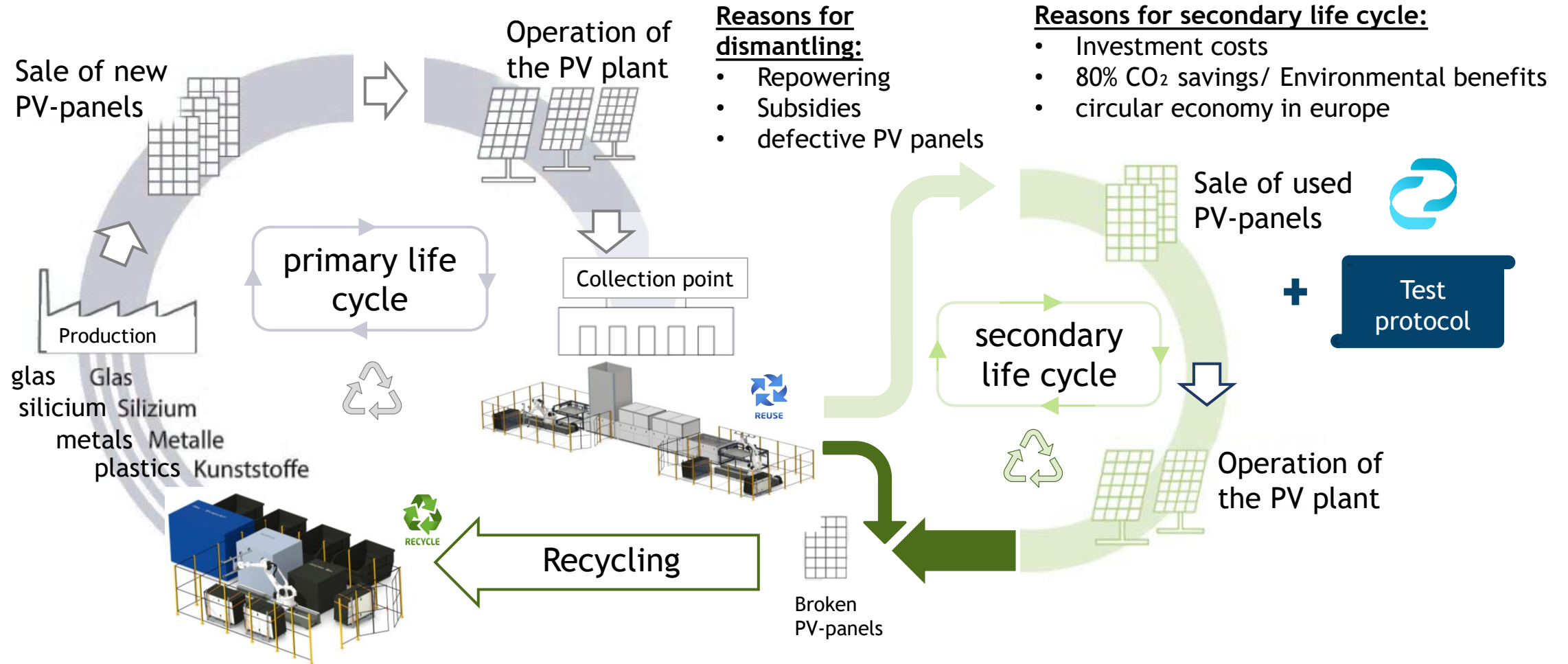
Our innovative answer, the combination of upcycling and recycling

Dismantled PV modules, either transforms our plant, to reusable PV modules or secondary raw materials.





Building a Circular Future for PV Modules





Let's Build Circularity into Solar - Together

We're looking for PV park operators, recyclers, investors & policymakers

Contact: s.prueller@2ndcycle.at | www.2ndcycle.at



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