



Technical stakeholder meeting

Ecodesign measures under preparation on PV modules and inverters

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DG GROW

European Commission

Agenda

- Welcome + tour de table
- Short general introduction to the product group/policy framework
- Draft requirements under preparation
- The new conformity assessment procedure
- Q&A

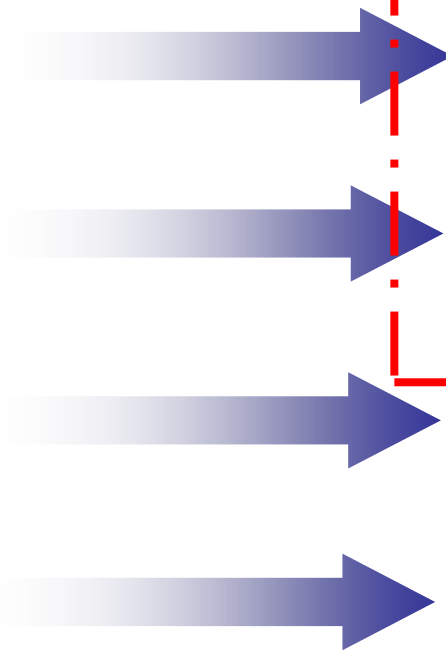


Objectives of regulatory initiatives on environmental aspects

- **Better performing and more durable** PV products available on the EU market: increasing quality in manufacturing processes and facilitating their repair
- More **circular products** available on the EU market: increasing their recyclability.
- PV products with **lower GHG impacts** from the production stage.
- PV inverters available on the EU market that have a **standardised interconnectivity**.
- **Empower consumers** to make an informed and sustainable choice at the point of sale.



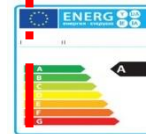
**Concept: ONE
research
process for
different
policies**



• *Ecodesign minimum requirements?*



• *Energy Label classes?*



• *Ecolabel criteria?*



• *GPP criteria?*

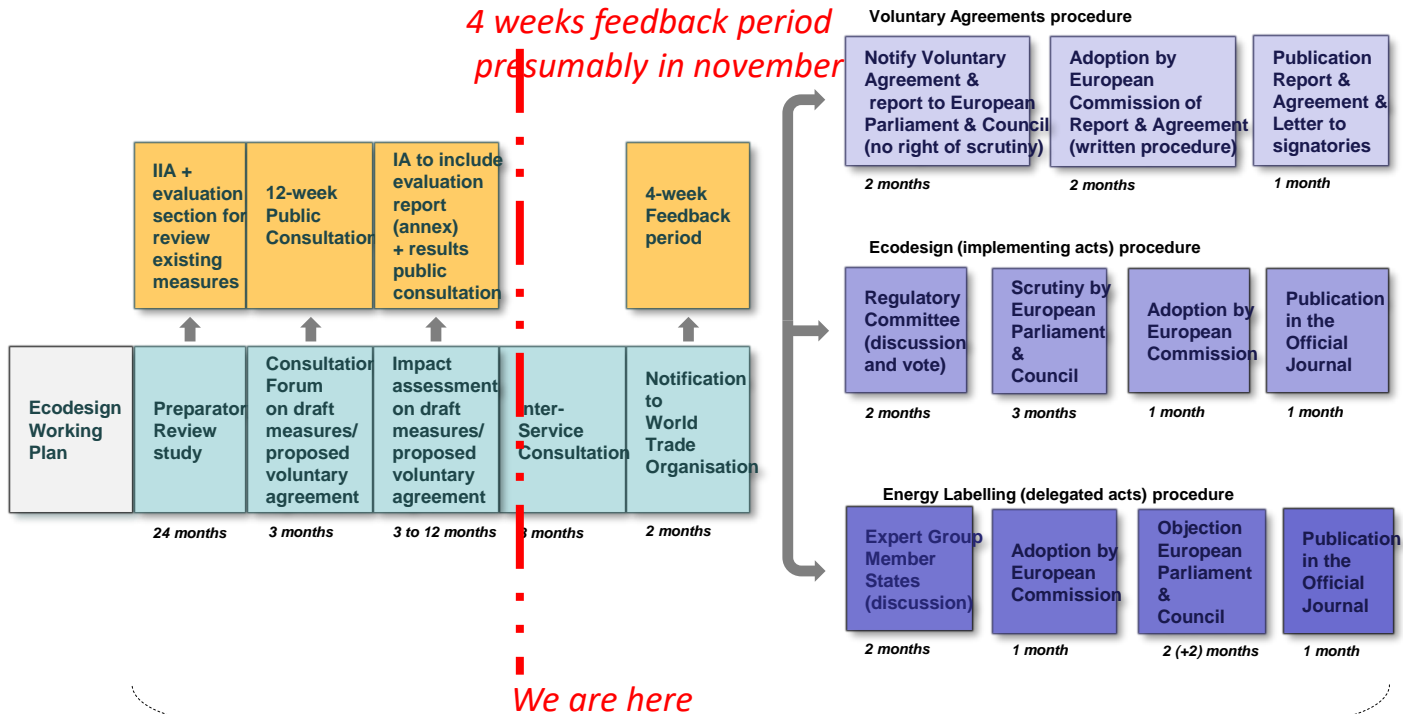


The results: a policy mix with mandatory instruments + Green Public Procurement

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The policy implementation process

Process for adoption of Implementing Measures under Ecodesign & Energy labelling - Alignment with Better Regulation



40 – 42 months – IDEALLY. Reality: can be very different.

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Requirements/labelling under preparation

PV modules

- energy yield (information)
- Durability
- Performance long-term degradation
- Repairability
- Recyclability
- Carbon footprint

PV inverters

- Efficiency (quantitative)
- Durability
- Smart readiness
- Repairability
- Recyclability

Energy label

- PV modules



REQUIREMENTS ON DURABILITY FOR PV MODULES AND PV INVERTERS

Quality and degradation: EN IEC 61215

Standard	Subject covered
EN IEC 61215-1	Design qualification and type approval - Part 1: Test requirements
EN IEC 61215-2	Design qualification and type approval - Part 2: Test procedures
EN IEC 61215-1-1 to -4	Specific requirement for each PV technology

Specific tests covered:

- *Thermal cycle test*, with temperature and electrical current as stressors;
- *Damp heat test*, combination of effects due to temperature and humidity;
- *Humidity freeze test*, on sealing materials and components;
- *UV test*, for polymeric components;
- *Static mechanical load test* simulates loads such as those by constant wind or homogeneous snow accumulation;
- *Hot spot test* linked to partial shading on modules;
- *Hail test*.

Quality and degradation: EN IEC 62093

Standard	Subject covered
EN IEC 62093	Photovoltaic system power conversion equipment Design qualification and type approval

Specific tests covered

- **Voltage (dielectric strength) test**
- **Bus link capacitor thermal test**
- **Power transistor module thermal test**
- **Humidity freeze test**
- **Thermal cycling test**
- **Damp heat test**
- **Dry heat test**
- **UV weathering test**



REQUIREMENTS FOR PV MODULES – CARBON FOOTPRINT

Requirement on carbon footprint

- **Aim to create transparency on the market and allow buyers / authorities to compare the carbon footprint of different modules placed on the market / allow only products above a certain threshold to be placed on the EU market**
- **(from the prep study): high relevance of the production phase of PV modules on their overall life-cycle environmental impacts**
- **Some MS (IT, FR, ES) introduced PP schemes for PV modules requiring inter alia information – and even quantitative – requirements on the products' environmental / carbon footprint**
- **The carbon footprint assessment focus on emissions linked to the raw material selection, manufacturing phase, as well as distribution to a regional storage facility. The 'climate change' life cycle impact assessment method expressed in kg of CO_{2eq} per kWh produced by the PV product**

Requirement on carbon footprint

- Need for clear harmonised rules and assumptions for modelling and calculation
- Product Environmental Footprint Category Rules (PEFCRs) are available for PV modules * → this would be the reference methodology, 'translated' under Ecodesign (Annex IV of the working document)
- The dataset list will be updated with the datasets of version **3.x** as soon as these will become available for PV modules.

* 'PV MODULES USED IN PV POWER SYSTEMS FOR ELECTRICITY GENERATION'
VERS 1.2

Requirement on carbon footprint

- Coverage of technologies: 5 of the PEFCR

Further analysis/check ongoing on:

- Bifacial modules
 - Silicon based tandem junctions
-
- The calculation procedure could also be feasible with an online tool.

Tool harmonises:

- Modelling
- Secondary datasets used
- Company-specific data required
- ..

Requirement on carbon footprint – regulatory approaches

- **Ecodesign requirement on a maximum admitted threshold for the carbon footprint**
- **Ecodesign information requirement**
- **Carbon footprint information to be reported in the energy label of PV modules, and/or in the related product information sheet (*legal analysis needed)**
- **Ecodesign quantitative requirements on specific relevant parameters influencing the carbon footprint, such as the silicon content or the module yield.**



Conformity assessment (carbon footprint)

Conformity assessment
with possible NB
involvement
(documentation, basis
for DoC)



Placing on the
market



Market surveillance
(based on product or
documentation)

Notified bodies

Article 8(2) of the Ecodesign Directive foresees the **possibility to take account of such specificities** by adapting the relevant conformity assessment procedure, e.g. by involving **notified bodies (NBs)**.

= bodies notified by Member States to the Commission to be **independent and competent to carry out the third-party conformity assessment tasks** foreseen by the regulation

The procedure and requirements for notification will be set out in the regulation, based on the **standard provisions and modules of the New Legislative Framework** (see Decision 768/2008).

Requirement on carbon footprint (conf. ass.)

Article 8(2) of the Ecodesign Directive foresees the **possibility to take account of such specificities** by adapting the relevant conformity assessment procedure, **e.g. by involving independent third parties**.

Specificity:

- normally MSAs can verify compliance with applicable requirements by testing individual products;
- this does not hold for verification of the reliability of the carbon footprint declaration (especially for company-specific data).

Procedure proposed is **part of the same module** as the conf. ass. procedure linked to the requirement on **reliability**

Requirement on carbon footprint (conf. ass.)

The manufacturer lodges an **application for verification with the same notified body** that approves its quality system (see reliability requirement)

Application includes a **supporting study** containing:

- Documentation of info put into the calculation tool
- Including all company-specific data + underlying documentation

Notified body verifies all information, with **special attention for company-specific data** (verification of the company-specific data shall always be organised through a visit of the production site(s) the data refer to).

Verification based on: comparing data to **underlying documentation** (provided by manufacturer or requested by NB) + assessment of **reliability of documentation** + **observation during site visit**

Requirement on carbon footprint (conf. ass.)

Result in case of **positive assessment**:

- NB issues carbon footprint **certificate**;
- valid for a maximum of **three years**.

Afterwards: annual **surveillance** by responsible NB, including verification of updated company-specific data

Re-calculation and re-verification required in case the carbon footprint **worsens by more than 10.0% compared** to the verified data (whether noticed during surveillance or by the manufacturer itself)



CIRCULAR ECONOMY REQUIREMENTS FOR PV MODULES

Requirement on repairability & dismantlability

- **Information requirement**

The manufacturer shall declare on

the possibility to access and replace the bypass diodes in the junction box,
the possibility to replace the whole junction box of the module.

Requirement on recyclability

- Information requirement

The manufacturers shall report on the potential to separate and recover the semi-conductor, the frame, glass, encapsulants and backsheet.

- Design measures to prevent breakage and enable a clean separation of the glass, contacts and internal layers during the operations shall be detailed.

the content in grams of the following critical raw materials and environmentally relevant materials (LIST UNDER REVISION)

- Lead
- Cadmium
- Silicon metal
- Silver
- Indium
- Backsheet fluorinated additives
- Gallium
- Tellurium
- Metal solder and contacts
- Glass fining agents
- Phthalates in power cables



CIRCULAR ECONOMY REQUIREMENTS FOR PV INVERTERS

Requirement reparability

- **Information requirements**
- **Repairable/spare parts - 2019 Regulations**
 - list of electronic/electromechanical components of the inverter available for a minimum period of 15 years
 - at least each individual printed circuit board and disconnectable component provided as spare part
 - the delivery must take place within 15 working days.
 - replaced using the tool classes established depending on the size of inverters.
- **Access to repair/maintenance information**
- **Dissassembly: Class requirements as established according to the EN 45554:2020, e.g. for inverters above 30 kW*:**
 - class A for fasteners and connectors, tools and working environment,
 - class B for skill level

* e.g. installations on residential buildings, small commercial or mixed residential/commercial buildings

Requirement on recyclability

- **Information requirement**
- **The manufacturers shall report on the content in grams of the following critical raw materials and environmentally relevant materials**

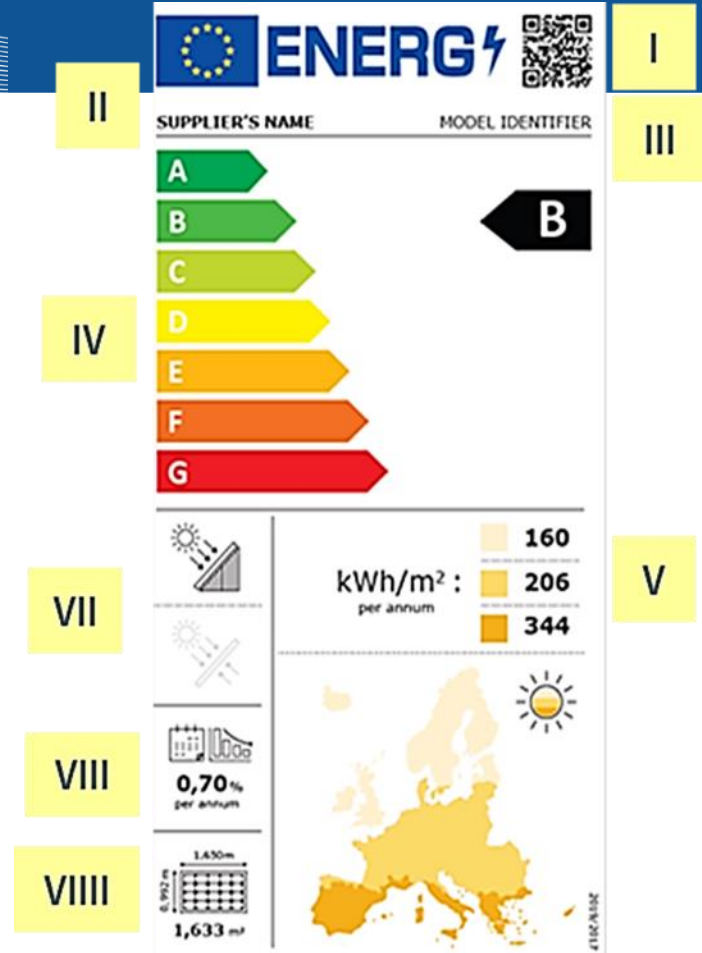
- Lead
- Cadmium
- Silicon carbide
- Silver
- Gallium
- Phthalates in power cables
- Tantalum
- Indium



ENERGY LABEL UNDER PREPARATION

Draft Energy Label

(final design may change)





AOB / CONCLUDING REMARKS



THANK YOU FOR YOUR ATTENTION!