JAHARP2022

PROSAFE Joint Actions Best Practice

Co-funded by the European Union

Layman's Report

JAHARP2022-02

Ancillary equipment to solar panels/pellet stoves

"Every day across the EU, invisible guardians work behind the scenes to keep unsafe and non-compliant products off the shelves and fairness on the playing field.

Because safety is not a product—it's a process that never stops."

PROSAFE – The Product Safety Forum of Europe

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List of abbreviations

AC	Alternating Current
ADCO	Administrative Cooperation Group
CE	European Conformity (Conformité Européenne)
CO	Carbon monoxide
DG GROW	Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs
DoC	Declaration of Conformity
EEA	European Economic Area
EISMEA	European Innovation Council and SMEs Executive Agency
EMC	Electromagnetic Compatibility
EN	European Standards
EO	Economic Operator
EPREL	European Product Registry for Energy Labelling
EU	European Union
GA	Grant Agreement
ICSMS	Information and Communication System for Market Surveillance
ISO	International Organization for Standardization
MARS	Advisory Group on Market Surveillance
MS	Member State
MSA	Market Surveillance Authority
NOx	Nitrogen Oxide
OGC	Organic Gaseous Compound
OJ	Official Journal of the European Union
PM	Particulate Matter
PV	Photovoltaic
RED	Radio Equipment Directive
UNECE	The United Nations Economic Commission for Europe
WP	Work Package

Executive Summary

The Joint Action on Harmonised Products 2022-02 (JAHARP2022-02) started in April 2023 and ended in March 2025.

The project focused on verifying the compliance of two product categories:

- **Ancillary equipment to solar panels**, against the Electromagnetic Compatibility Directive (EMCD) 2014/30/EU [1] and the Radio Equipment Directive (RED) 2014/53/EU[2]
- **Pellet stoves** against the Ecodesign Regulation (EU) 2015/1185 [3] and the Energy Labelling Regulation (EU) 2015/1186[4]

The Market Surveillance Authorities (MSAs) selected 23 ancillary equipment to solar panels and 9 pellet stoves for administrative checks and laboratory testing.

95% of the tested solar panel equipment and 89% of the pellet stoves were found non-compliant with EU regulatory requirements.

The MSAs encountered different challenges during testing of the products, pointing at the need for improvement of the testing standards.

In fact, tests on some of the sampled ancillary equipment to solar panels led to inconclusive results, and the project group on pellet stoves noted that the stoves configuration for testing carries considerable complexity.

Based on the results and on the risk assessment, the MSAs contacted the responsible Economic Operators and took appropriate enforcement measures as needed.

[1] Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility

[2] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC

[3] Commission Regulation (EU) 2015/1185 of 24 April 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for solid fuel local space heaters

[4] Commission Delegated Regulation (EU) 2015/1186 of 24 April 2015 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of local space heaters

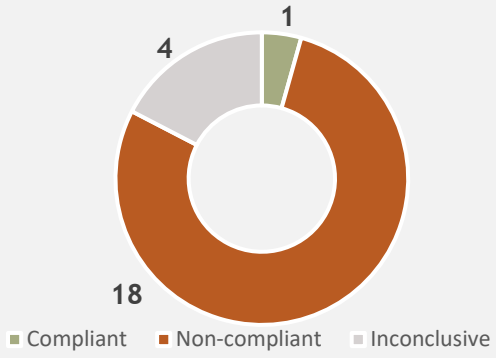
Highlights and key results

Caution! The results are based on products that were sampled from the markets in the participating countries by experienced market surveillance inspectors. As in any routine market surveillance activity, the results represent the targeted efforts that authorities undertake to identify non-compliant products. They do not give a statistically valid picture of the market situation.

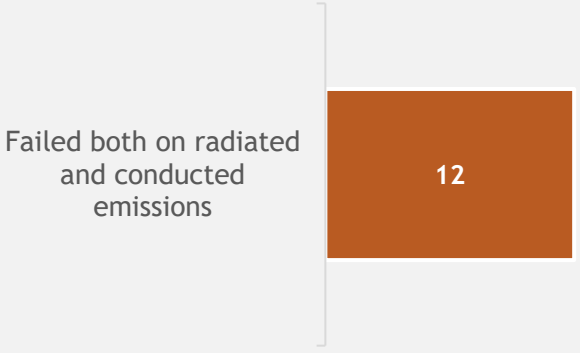
ANCILLARY EQUIPMENT TO SOLAR PANELS

23
Sampled for inspection and testing

Test results



Samples failed both radiated and conducted emission tests



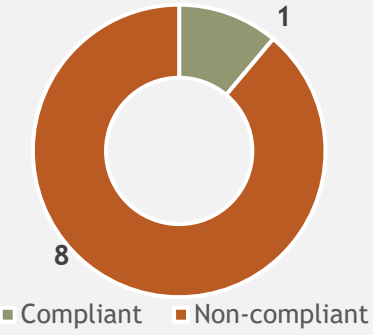
4 sales bans

7 withdrawals

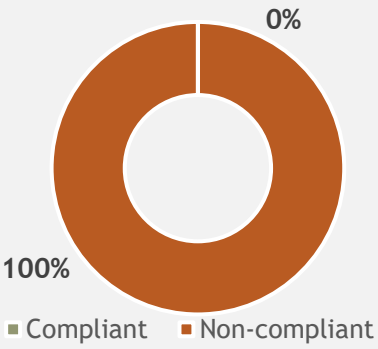
PELLET STOVES

9
Sampled for inspection and testing

Single test results



Triple testing results



2 voluntary withdrawals

JAHARP2022 Omnibus

The Joint Market Surveillance Action on HARmonised Products 2022 (JAHARP2022) is a portfolio of projects co-funded by the European Union, comprising seven product areas and two horizontal/capacity building activities, implemented in synergy.

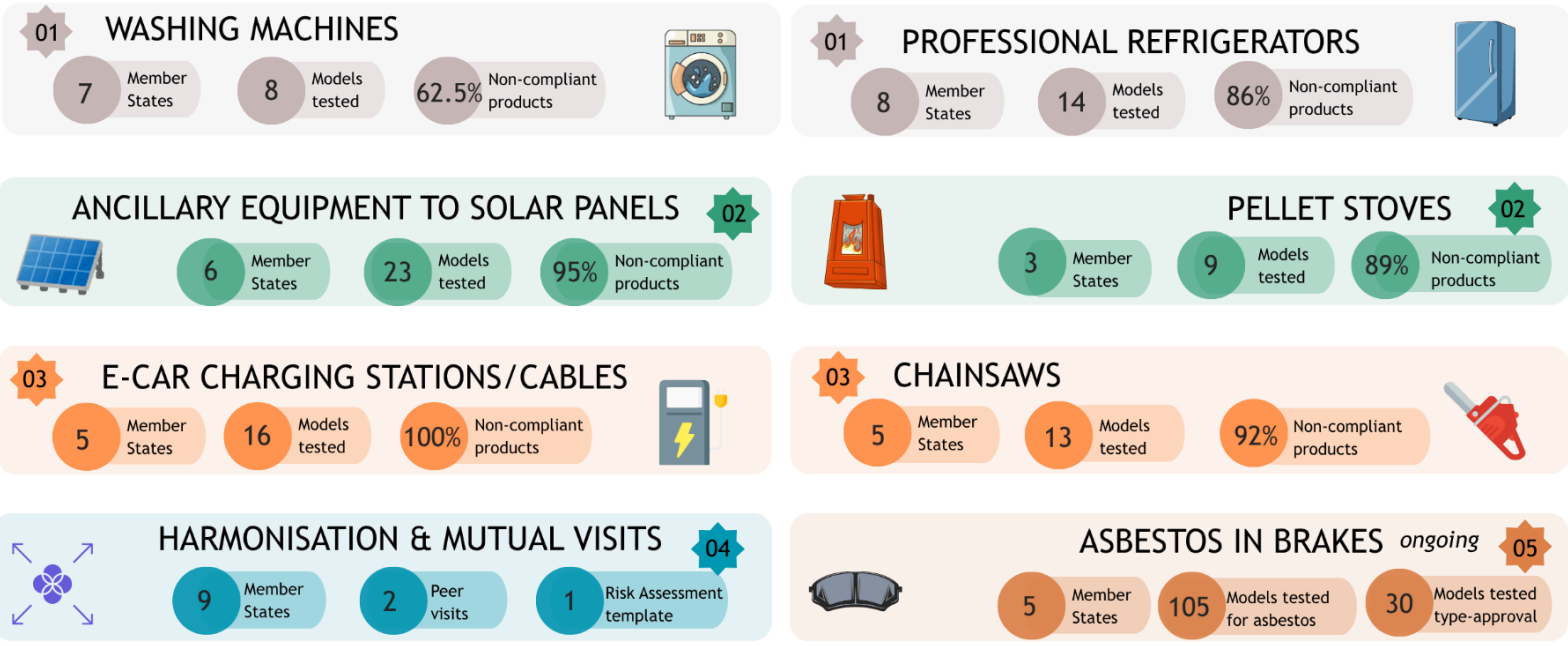
The shared strategic objective of JAHARP2022 is twofold:

- Remove non-compliant products from the Single Market
- Support the implementation of Regulation (EU) 2019/1020 [5] on Market Surveillance

Market Surveillance on products entering the Single Market is the responsibility of national authorities, which have to adhere at the same time to European and national legislation, in some cases causing differences in the implementation.

For this reason, and because of the emerging challenges that Market Surveillance Authorities (MSAs) face in their daily work, joint actions are an essential tool to promote the coordination and harmonisation of practices and methodologies among European authorities, by conducting transnational campaigns focused on specific products and legislations and favouring the exchange of information and best practices.

An overview of the projects part of the JAHARP2022 portfolio is provided in the figure below.



Caution! The results are based on products that were sampled from the markets in the participating countries by experienced market surveillance inspectors. As in any routine market surveillance activity, the results represent the targeted efforts that authorities undertake to identify non-compliant products. They do not give a statistically valid picture of the market situation.

[5] Regulation (EU) 2019/1020 of the European Parliament and of the Council of 20 June 2019 on market surveillance and compliance of products and amending Directive 2004/42/EC and Regulations (EC) No 765/2008 and (EU) No 305/2011

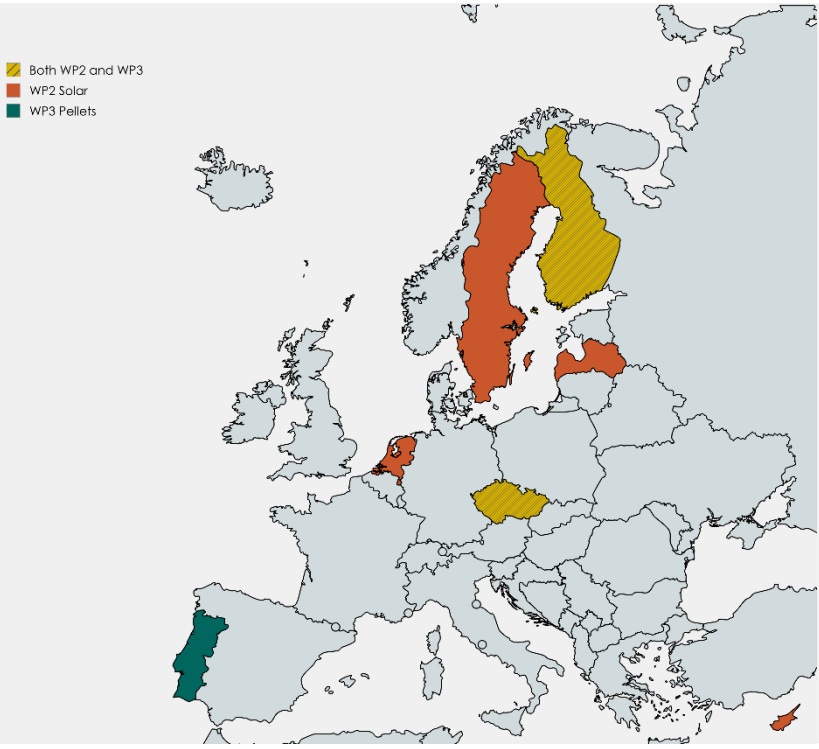
Introduction to JAHARP2022-02

Participating authorities

The Joint Action was undertaken by eight (8) Market Surveillance Authorities from 7 EU countries:

Cyprus, Czech Republic, Finland, Latvia, The Netherlands, Portugal and Sweden.

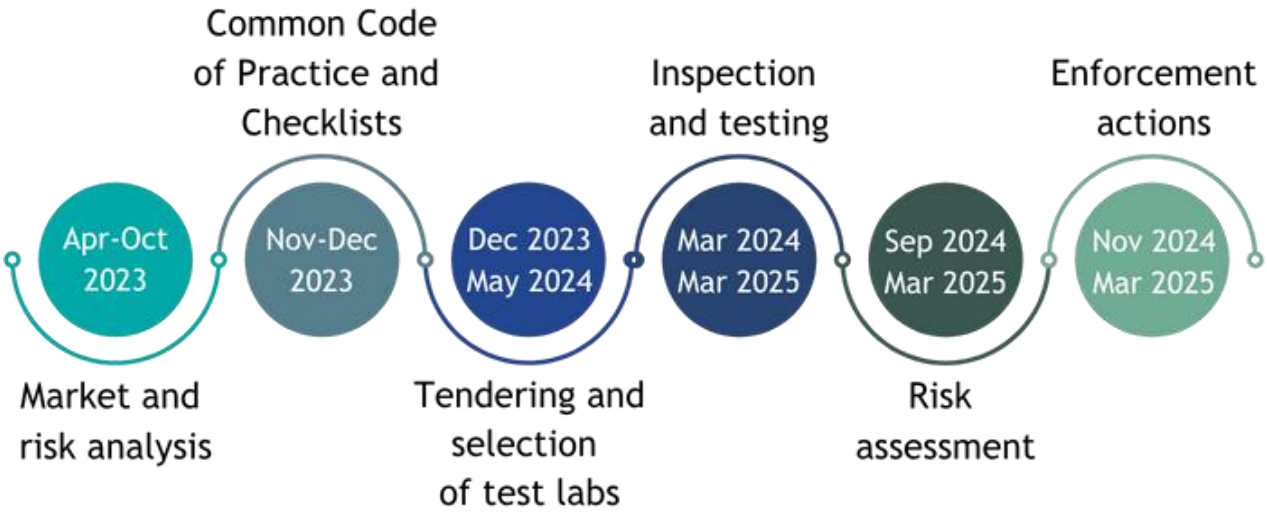
Six (6) authorities participated in Work Package 2 on ancillary equipment to solar panels and three (3) authorities participated in Work Package 3 on pellet stoves.



Timeline of the Joint Action

The Joint Action followed the methodology of the typical market surveillance cycle, starting with a risk-based market analysis which informed the decisions on the products to be selected for document inspections and for laboratory testing. Two laboratories were selected through a tender procedure aimed at identifying the test body offering high expertise at the best value for money. Based on the results, the national authorities assessed the risks posed by non-compliant products to consumers and the market and took appropriate enforcement actions.

The timeline of the project activities is shown in the graph below.



Ancillary equipment to solar panels

Solar photovoltaic (PV) modules generate electricity from sunlight. Using an inverter, this electric power can be fed into the main electrical supply of a building, or directly into the public electricity grid.

An inverter for solar energy systems is an apparatus that converts DC (Direct Current) into AC (Alternating Current), in order for it to be used in the electricity network.

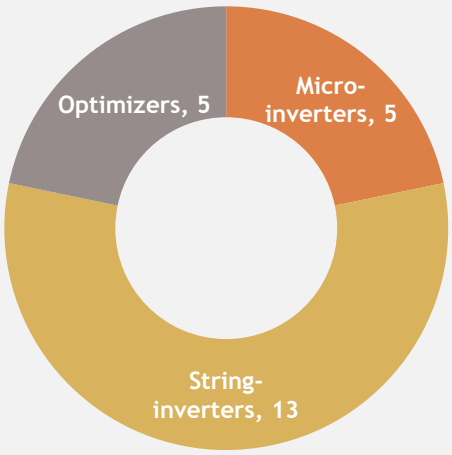
The workgroup focused selected 23 ancillary equipment focusing on three types of products, installed on Class B (residential) units as described below. The graph at the bottom of the page shows the distribution of the selected samples among the three types.

- **Micro-inverters:** This type of inverter is being installed outside the building, behind the solar panel. It is often used in small systems with different angles of inclination and orientations. Each micro-inverter converts the current of each single solar panel.
- **String-inverters:** One or more strings (series of solar panels) are attached. In one string all solar panels are oriented in the same direction. The string inverters convert the DC current of the whole string of solar panels into AC current.
- **Power Optimizers:** Power optimisers do not convert the DC current to AC current but work to optimise the performance of the solar panels, especially if placed in shaded or unevenly lit conditions. They are then connected to inverters which convert the current to AC.

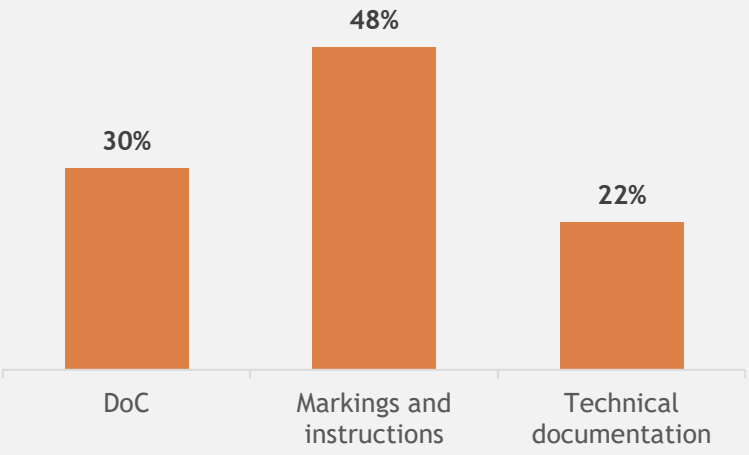
Document inspections

The workgroup verified the completeness and correctness of the Declaration of Conformity (DoC), the markings and user instructions accompanying the products, and the technical documentation. They observed several issues, mostly concerning missing mandatory information in the different documents, which highlights the need for **further education of Economic Operators** (EOs). The non-compliance levels observed are shown in the graph below.

Type of ancillary equipment sampled



Non-compliance levels in doc checks



Laboratory tests

The participating MSAs selected 23 products for testing against EMC requirements on **radiated and conducted emissions** and the conducted emissions requirements of the RED, in the case of samples having wireless connection.

Electromagnetic interference (EMI) occurs when electrical devices are exposed to external electromagnetic fields. Exposure to EMI can lead to component degradation and eventually to the product not working properly anymore.

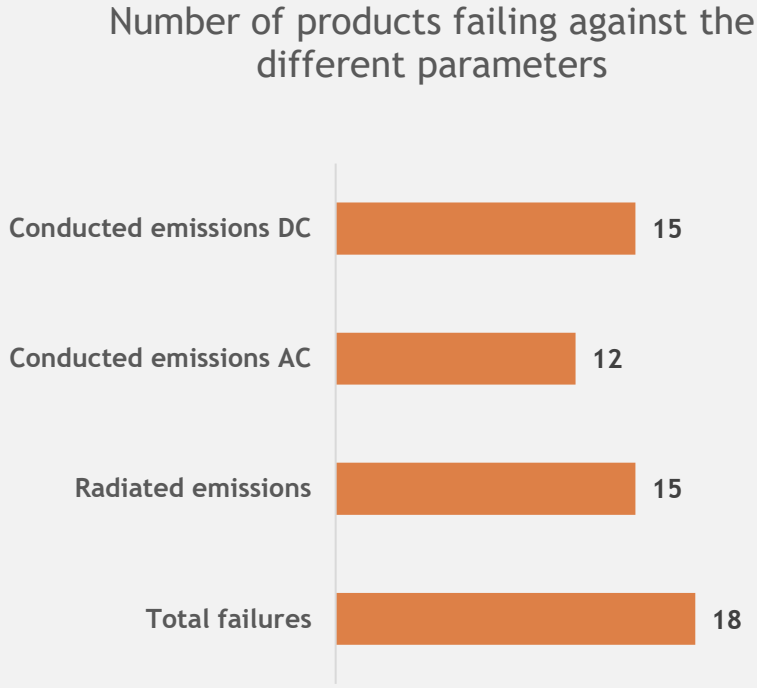
Conducted emissions are interferences transferred from a source to a receiver along a cable, while radiated emissions do not require an electrical connection to be transferred and are in the form of electromagnetic waves.

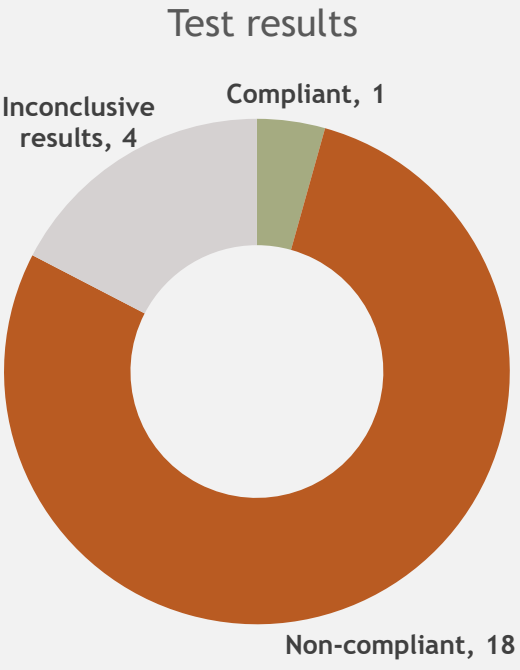
Testing of some of the samples was particularly complex, leading to 4 models having inconclusive results.

In total, **18 (95%) of the 19 equipment with conclusive test results failed in at least one test parameter**, with 79% of the products failing on radiated emissions and 74% failing on DC or AC conducted emissions.

It should be noted that not all parameters were applicable to all types of ancillary equipment, therefore not all tests were conducted on all samples.

The number of products failing against each test parameter is shown in the graph below.





Caution: the results represent the targeted efforts that authorities undertake to identify non-compliant products. They do not give a statistically valid picture of the market situation.

Risk assessment and follow-up measures

The MSAs assessed the risks posed by the non-compliant products using the risk assessment methodology developed by the EMC ADCO group, in conjunction with the approach developed by the UNECE MARS group.

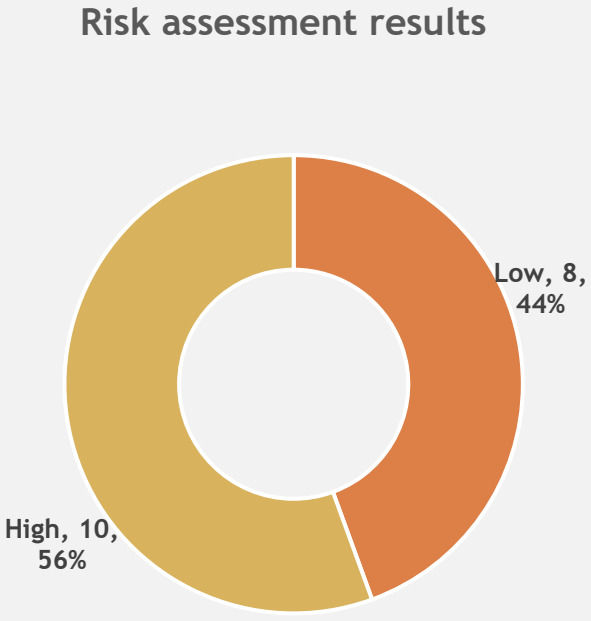
High measurement results of radiated and conducted emissions (>50 dB over limit) can affect other equipment, in particular safety-related and sensitive radio communications.

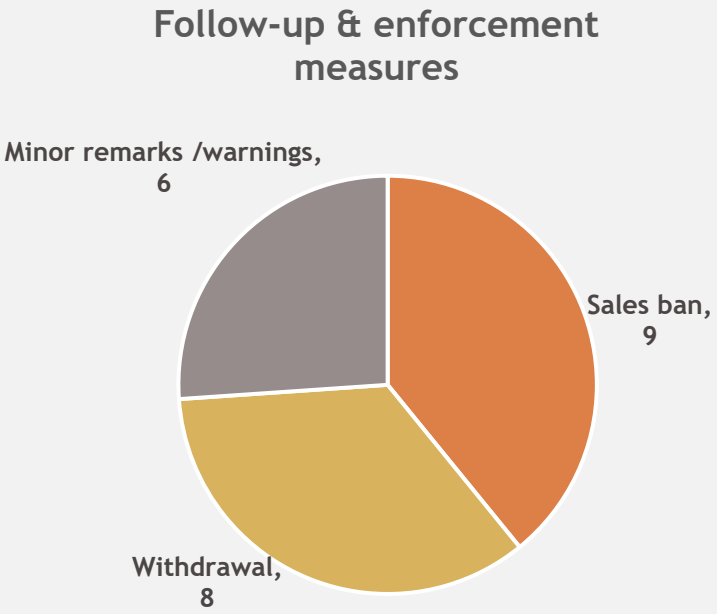
In fact, high conducted and/or radiated emission levels can provoke the malfunctioning of the device by causing glitches or power supply issues such as instability or voltage spikes, disrupt the operation of other electronic devices and could interfere with radio communication causing signal degradation or loss of contact.

All non-conformities were evaluated as low, high or serious risk based on their distance from the emission limit in the legislation.

Ten of the non-compliant products were evaluated as a high risk, while 8 were considered low risk. No product was assessed as posing a serious risk at the moment of writing this report. The results of the risk assessment are shown in the graph below.

After the assessment of the risks, the MSAs contacted the Economic Operators and took enforcement measures as deemed appropriate. As a result, MSAs ordered the **withdrawal of eight products from the market, while nine sales bans were issued**.





Pellet stoves

Pellet stoves are **solid fuel heaters** using wood pellets (with a nominal heat output of 50 kW or less).

These products fall under the Ecodesign Regulation (EU) 2015/1185, and the Energy Labelling regulation (EU) 2015/1186. They also fall under the Construction Products Regulation (EU) No 305/2011, but this action only focused on the Ecodesign and Energy Labelling Regulations.

The project group sampled two kinds of pellet stoves as described below. The graph at the bottom of the page shows the distribution of the samples among the two types.

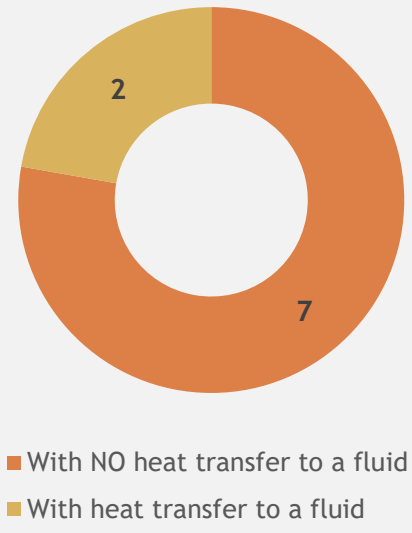
- **Pellet stoves with no heat transfer to a fluid:** these products are used only for space heating as they do not have a connection to water or heating systems. They directly heat the room via radiation and convection.
- **Pellet stoves with heat transfer to a fluid:** these stoves provide both space and central heating, supporting radiators, underfloor heating or hot water. They include a heat exchanger to transfer heat to water.

Document inspections

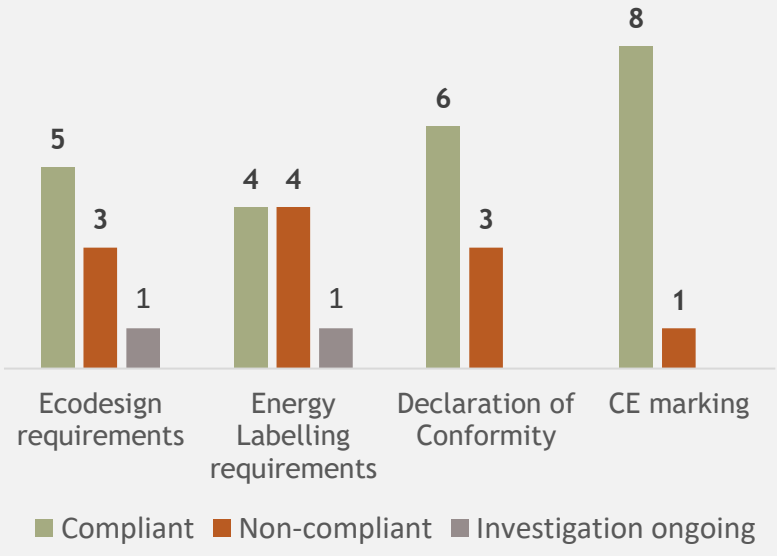
The participating MSAs conducted documentation checks on the nine pellet stoves identified, starting from the verification of the products' presence on the European Product Registry for Energy Labelling (EPREL) as required by the EU legislation. They then checked the compliance of the DoC, the presence of the CE marking, and that the ecodesign and energy labelling information in the technical documentation was complete and correct.

All products were present on EPREL, but other non-conformities were observed in the documentation, in particular with reference to missing required energy labelling information.

Type of pellet stoves sampled



Doc checks results



Laboratory tests

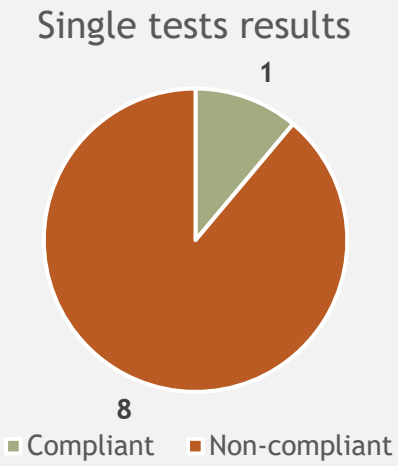
The pellet stoves underwent laboratory testing in an accredited laboratory against ecodesign and energy labelling requirements.

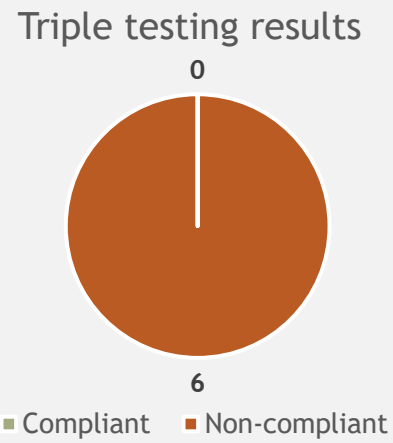
In particular, the laboratory measured the **emission levels** of Particulate Matters (PM), Organic Gaseous Compounds (OGC), Carbon monoxide (CO) and nitrogen oxide (NOx) at nominal heat output and at minimum heat output. These are particularly important because of their negative impact on the environment and consumers' health.

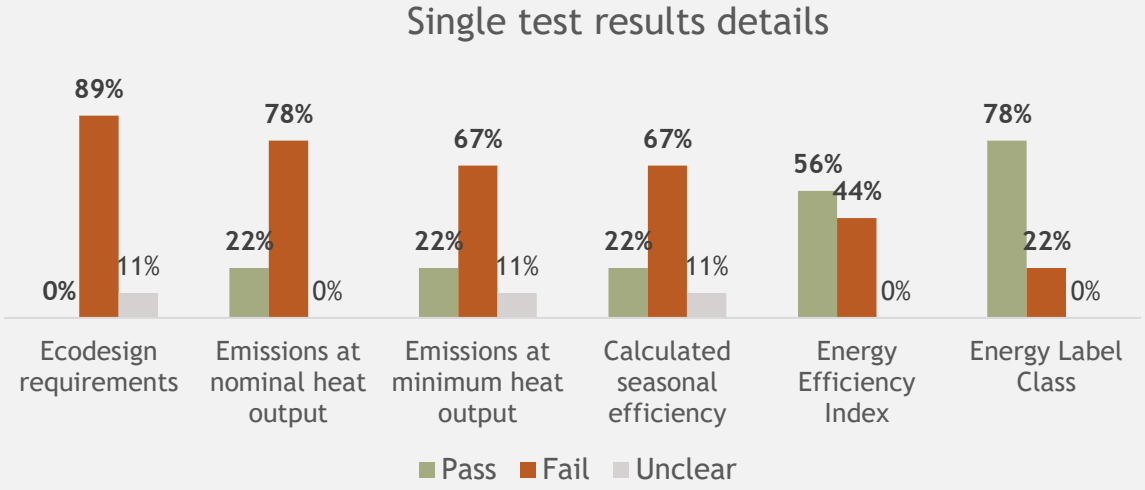
8 out of 9 products were assessed as non-compliant after single testing, with all 8 failing on at least one ecodesign requirement. More details on the test results are in the graphs below.

Two of the non-compliant products were selected for triple testing, which confirmed the initial non-compliance assessment.

As previously mentioned, the project group encountered challenges in the setting-up of the pellet stoves for testing, due to a lack of detail in the standards referenced in the transitional methods.







Caution: the results represent a small number of products sampled from the market and may not give a statistically valid picture of the market situation.

Risk assessment and follow-up measures

Following the identification of non-conformities through documentation checks and laboratory testing, the workgroup undertook a process to assess the risks posed by these products. The aim was to foster a common understanding and approach to risk classification, which is essential for determining proportionate follow-up actions by Market Surveillance Authorities (MSAs) and for consistent reporting in ICSMS.

The group applied the risk assessment methodology developed by the Ecodesign ADCO. This methodology requires MSAs to:

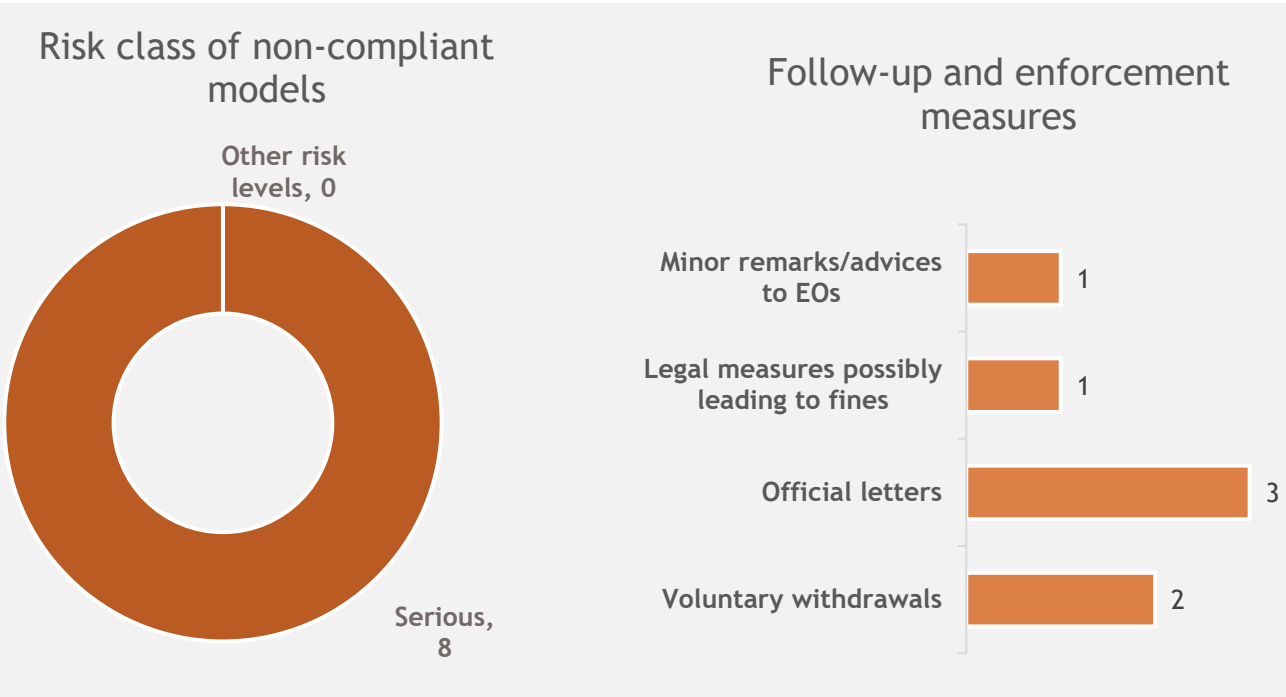
- Define a "**Non-Conformity Class**" for each identified non-conformity. This class considers the nature of the non-conformity against the legal requirements (e.g., minor formal error, essential formal error, technical change required, conformity not possible).

- Define a "**Damage Class**" for each non-conformity. This evaluates the actual or potential effect and severity of the harm that could result from the non-conformity. For Ecodesign and Energy Labelling, this often relates to environmental damage (e.g., excess energy consumption, increased air pollutant emissions) or economic damage to consumers (e.g., higher running costs, misleading information) rather than immediate safety hazards.

- Combine these two classes to determine an overall "**Risk Classification**" (e.g., No Risk, Low Risk, Medium Risk, High Risk, Serious Risk) for the product.

Failure to reach emissions levels was considered as posing a potentially serious risk, therefore all non-compliant stoves were assessed as such, as shown in the graph below.

Appropriate follow-up actions and enforcement measures were taken by the participating MSAs. As a result, two products were withdrawn voluntarily from the market by the Economic Operators.



Recommendations

Based on the non-conformities observed during the cross-border market surveillance action in relation to the two products, the market surveillance authorities drafted some recommendations for Economic Operators and for consumers, together with some policy recommendations for the European legislative and standardisation bodies. These are presented below:

Recommendations for Economic Operators

Markings and Instructions: Economic Operators should ensure that the products have all needed markings and that user instructions are available in the national languages of the Countries where they are sold.

EU Legislation: Economic Operators should ensure the products are safe and compliant with all applicable EU Legislation.

EPREL: Economic Operators placing energy related products on the market should ensure the product information is present on EPREL.

Recommendations for Consumers

Safety Gate: Consumers should consult the Safety Gate portal to check for products subject to corrective measures.

Energy Label: Consumers should pay attention to the Energy Label of the products they purchase and make sure to choose the most energy efficient models.

Policy recommendations:

Harmonised standards: The project group found the unavailability of the EN 62920:2017 EMC standard to be an issue for testing ancillary equipment to solar panels.

In addition, Standards referenced in the transitional methods for pellet stoves did not provide enough detail on product set up, unavoidably leading to some degree of variability in the results.

Further research: Additional research on the electromagnetic coupling related to the cabling in solar systems is necessary to improve the requirements in the standards and the safety of ancillary equipment.

Risk Assessment Methodology: The MSAs registered the need for an updated risk assessment methodology both in the field of EMC and Ecodesign/Energy Labelling.

Conclusions and lessons learned

The JAHARP2022-02 joint action has generated significant impacts across EU legislation, MSAs, society, and the market.

Both product-specific activities **strengthened the technical capacity of participating MSAs**, facilitating cooperation, and enabling the development and sharing of knowledge, methodologies and experiences specific to the two product areas under investigation. This collaborative approach, including the development of common tools and approaches to complex issues like test result interpretation, strengthens the overall capacity and effectiveness of market surveillance for these product groups within the EU.

The project also provided a platform to discuss and manage challenges, such as product availability for sampling and testing issues.

The impact extends beyond the immediate participants, reaching all EU MSAs through the dissemination of project outcomes via the EUPCN and relevant ADCOs. Additionally, participating MSAs benchmarked their work against peers, fostering collaboration to establish more standardised approaches and enhance the cost-effectiveness of their campaigns.

The workstream on ancillary equipment to solar panels highlighted the need to expedite the publication of EN 62920 to avoid future testing gaps. Furthermore, this joint action **set the groundwork for future EMC standards** to integrate systematic risk evaluation.

At the same time, the work conducted on pellet stoves and its alarming findings on the non-compliance rate on the market provided **timely and practical evidence for the ongoing reviews of the Ecodesign Regulation (EU) 2015/1185 and Energy Labelling Regulation (EU) 2015/1186**.

The joint action drafted policy recommendations for the European Commission and the European legislative and standardisation bodies which were presented during the final conferences held in March 2025.

JAHARP2022-02 was part of the JAHARP2022 portfolio of joint actions, involving 25 MSAs from 16 Countries and coordinated by PROSAFE. The Joint Actions focused on seven product categories falling under different Safety and Energy Efficiency legislations and on the harmonisation of market surveillance methodologies across member States.

JAHARP2022-02 was co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Innovation Council and SMEs Executive Agency (EISMEA). Neither the European Union nor the granting authority can be held responsible for them.