ANTICSS
ANTI-CIRCUMVENTION OF STANDARDS
FOR BETTER MARKET SURVEILLANCE

CLOSING ALL ROADS TO CIRCUMVENTION OF EU ECODESIGN AND ENERGY LABELLING LEGISLATION AND STANDARDS

FINAL REPORT

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ABBREVIATIONS

AdCo	Administrative Cooperation Groups
ANTICSS	Project acronym: Anti-Circumvention of Standards for better market Surveillance
COLD	Household refrigerators and freezers (product category analysed in ANTICSS)
CV	circumvention
DISH	Household dishwashers (product category analysed in ANTICSS)
DRIER	Household tumble driers (product category analysed in ANTICSS)
EC	European Commission
ECO	name of a programme, e.g. in dishwashers
ED	Ecodesign
EEI	Energy Efficiency Index
EL	Energy labelling
EN	European Standard
EU	European Union
FAQ	Frequently Asked Questions
GWh	gigawatt hour
HEATERS	Space heaters / air-to-water heat pumps (product category analysed in ANTICSS)
ICSMS	internet-supported information and communication system for the pan-European market surveillance of technical products
IEC	International Electrotechnical Commission
kg	kilogram
km	kilometre
kWh	kilowatt-hour
MSA	Market Surveillance Authority
NGO	non-governmental organisation
OVEN	Ovens (product category analysed in ANTICSS)
RAC	Room air conditioners / air-to-air heat pumps (product category analysed in ANTICSS)
t	tons
TJ	Terajoule
TV	Televisions (product category analysed in ANTICSS)
W	watt
WASH	Household washing machines (product category analysed in ANTICSS)

1 / SUMMARY: KEY RESULTS AT A GLANCE

Aim and importance of the ANTICSS project

The European Union's Horizon 2020 research and innovation programme funded in 2018-2021 the project *ANTICSS – Anti-Circumvention of Standards for better market Surveillance* conducted by 19 partners of eight countries, coming from research organisations, Energy Agencies, Market Surveillance Authorities (MSAs), test laboratories and NGOs. Triggered by the diesel scandal, in which vehicles contained a certain defeat device that guaranteed compliance with emission limits during the test conditions while emissions in practice were much higher, the main objective of the ANTICSS project was a thorough investigation on whether such manipulations are also possible under EU ecodesign and energy labelling legislation, including capacity building and mitigation measures.

Where circumvention may happen

Manipulation of products or test instructions (circumvention) as well as exploitation of loopholes and weaknesses of regulations and standards (jeopardy effects) to reach more favourable results specifically in the test situation also happens under EU ecodesign and energy labelling legislation. In principle, any of the product categories covered by ecodesign and/or energy labelling regulations could be affected. ANTICSS analysed 8 product categories in more detail where in 18 suspect cases, either hints for circumvention behaviours or jeopardy effects became apparent. Among the same product categories, 24 models were tested by ANTICSS in laboratories and 6 of them showed a kind of circumvention behaviour.

Beyond defeat devices

ANTICSS clearly shows that circumvention cannot be achieved only by *automatic detection of the test situation and alteration of the product performance specifically during testing* as already defined and prohibited in some EU ecodesign and energy labelling regulations. Sticking strictly to that definition would restrict the MSA contrast actions against any form of circumvention.

Most cases detected in ANTICSS refer to a *pre-set or manual alteration of the product affecting the performance or resource consumption during testing*.

Especially a general reference to *following manufacturer's instructions* given in some standards opens the door for possible misuse: manufacturers may require that specific test instructions, preparations or pre-treatments of the appliances are used specifically only by the test laboratories that have no comprehensible justification (e.g. technical or safety reasons), but are aimed at achieving more favourable results compared to other products that do not follow such instructions.

In some cases, the specific product instructions may also be addressed to both test laboratories and consumers, with the favourable results achieved both in the test situation and during consumers' usage, but for the latter only theoretically or in (extremely) infrequent situations. In this situation, still, the design of the product or the test instructions seem to be finalised to reach more favourable results in the test situation. ANTICSS classified those cases as *jeopardy effects* and tested models with these test results as *borderline to circumvention*.

In other cases, pre-set possible operational modes or functions of products may lead to a jeopardy effect if the function reduced the energy consumption which is fully taken into account in the harmonised standard tests but is considered rarely applicable to real life. For example, TVs that detect fast changing content and react with a backlight reduction to better follow rapid scene changes and/or depicting a large amount of motion such as sports programmes that are considered by some experts as almost never broadcast in real life. Or refrigerators with the display of a controller, providing a digital clock activated each time the door is opened and disabled after 24h without door openings. This function saves energy when the consumer is absent for a holiday period, but the display is always activated in daily use of the appliance. The declared energy consumption measured with the digital clock deactivated (as captured by the specific test conditions which does not include any opening of the doors), represents the most efficient mode of the appliance and is not providing a good proxi of the actual use and energy consumption during real life.

The ANTICSS project provided also a clear delimitation of circumvention and jeopardy effects from non-compliance, use of golden samples, products designed for being out of scope, smart products in general as well as software updates. In addition, ANTICSS has also clarified that circumvention and jeopardy effects should not be confused with the fact that standards may not always reflect typical consumer use, i.e. missing representativeness of standards, and for this reason the values measured under real-life conditions may be different from the claimed performances.

What is lost

According to ANTICSS, the discovered acts of circumvention and borderline to circumvention in the product categories of washing machines, dishwashers, ovens, refrigerating appliances and televisions could sum up from 395 TJ (in the lowest option of the more *realistic scenario*) to 5,982 TJ (in the more theoretical *extensive scenario*) of potential primary energy savings that could be potentially lost each year, corresponding to 13,300 up to 201,800 tons of CO_2 equivalents. Over the total lifespan of the appliances this would amount to around 2.4 million tonnes of CO_2 equivalents. Not to forget further severe impacts of circumvention: market distortions, unfair competition among market economic actors, loss of reputation for individual manufacturers or entire industries as well as loss of consumers' trust in the overall effectiveness of European legislation and standards.

Tracing circumvention

When tested according to the test condition defined in the harmonised standards, at first glance a product appears to comply with all requirements. However, this is because the product itself or its settings have been manipulated, i.e. the test results are influenced in such a way that they become more favourable of what they would be without any manipulation. For this reason, it is rather impossible to detect circumvention through laboratory testing under harmonised standards specifications.

One of the most important findings of the ANTICSS project is the need for a new approach for compliance verification, able to specifically address circumvention suspicions. The main characteristics of this new procedure proposed by ANTICSS is the development of 'modified' measurement methods: only the parameter(s) of the standard test conditions considered prone to or under suspect of manipulation were slightly varied. At the same time, the modified test methods were still designed to be as close as possible to the methods in harmonised standards with the aim of ensuring comparability between the two sets of measurement results. In fact, only under the comparability of the two methods an inexplicably large variation in a measurement result(s) can be considered as an indication of a possible circumvention behaviour of the tested product.

The way forward

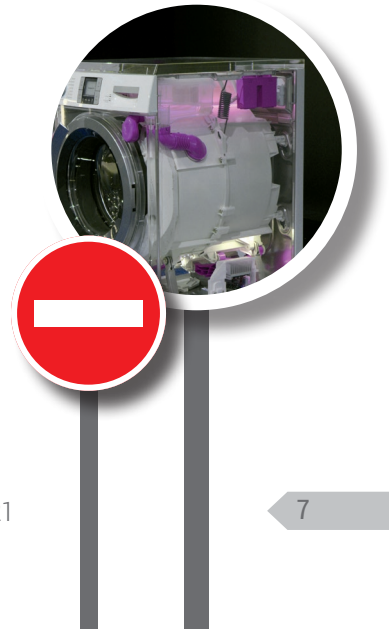
To close all roads to circumvention, the main recommendation from ANTICSS to EU policy makers and European Standardisation Organisations are to:

- extend the legal definition of circumvention in ecodesign regulations and the framework energy labelling regulation to cover – and therefore forbid – also the other situations encompassed in the ANTICSS definition of circumvention: (i) pre-set or manual alteration of the product, affecting performance and/or resource consumption during test and (ii) pre-set alteration of the performance within a short period after putting the product into service;
- specify in harmonised standards the conditions for the setting and use of manufacturer's instructions for laboratory testing, and clarify that their misuse, i.e. the use of such instructions for a specific set-up of the product in order to achieve more favourable test results is forbidden;
- specify under which conditions modified test methods aimed at indicating the presence of circumvention are legally usable by Market Surveillance Authorities during the compliance verification of products and constitute the legal basis for an eventual enforcement action against circumventing models; and
- regularly analyse the application of legislation and standards to identify loopholes and other weaknesses that may lead to jeopardy effects or might even facilitate circumvention.

Further need for research

Even if a lot has already been achieved by the ANTICSS project there is still some further need for research:

- Further fine tuning of the definition of circumvention, especially the specification of the types of pre-set or manual alteration of the product that should be considered as a circumvention.
- Further development of the ANTICSS classification of cases and models, especially the categorisation and consequences of jeopardy effects with tested models resulting into borderline to circumvention.
- Further development of modified test methods (e.g. randomised test patterns) including the assessment of their reproducibility and repeatability, and the definition of 'circumvention tolerances'.
- 'Resilience check' of current standards, i.e. the analysis of which of the test parameters could be randomised or slightly modified without influencing the test results for the regulatory requirements.
- Analysis of latest legislation and standards for (new) loopholes and weaknesses that might facilitate circumvention, including the analysis of further product categories not yet in focus of ANTICSS.
- Establishing a regular communication or collaboration platform engaging all relevant stakeholders to exchange experiences on circumvention.



2 / AIM AND IMPORTANCE OF THE ANTICSS PROJECT

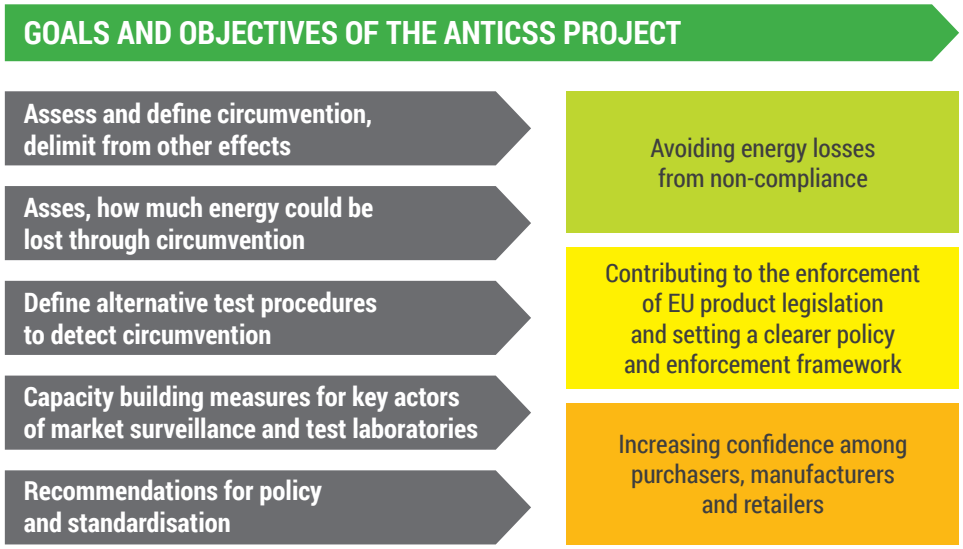
Ecodesign legislation sets mandatory minimum energy efficiency requirements for many products on the European market. The indication of the energy efficiency and consumption on the energy label along with the functional performance makes it easier for consumers to choose energy-efficient and more performing products. The ecodesign product specific regulations under Directive 2009/125/EC cover more than 25 product groups, including household appliances, lighting, heating and air-conditioning equipment, information and communication technologies and, increasingly, industrial equipment. The European Commission estimates that these two policy instruments together have contributed to about half of the energy efficiency target for 2020. Consumers also benefit from the regulations: having installed more efficient and performing appliances in their households, benefit of a reduced energy bill, lowering the water consumption.

On the other hand, the European Commission estimates that 10-25% of products put on the EU market do not fully comply with energy efficiency labelling regulations and around 10% of potential energy savings may be lost due to non-compliance[1]. According to the Special Report *EU action on ecodesign and energy labelling: important contribution to greater energy efficiency reduced by significant delays and non-compliance* of the European Court of Auditors this would roughly correspond to the final electricity consumption of Sweden and Hungary combined[2]. The reasons for non-compliance include a missing or incorrect energy label, non-compliance with information requirements, as well as incorrect classification of the energy class.

While reasons for non-compliance with the requirements, and the possible remedial measures have already been well analysed, the issue of circumvention of standards and requirements of the ecodesign and energy labelling legislation through manipulated test results has only few years ago started to receive due political attention. Triggered by the diesel scandal, in which vehicles contained a certain defeat device that guaranteed compliance with emission limits during the test conditions while emissions in practice were much higher, the investigation on whether such manipulations are also possible under other EU legislations was envisaged.

1 https://ec.europa.eu/commission/presscorner/detail/en/MEMO_19_1596
2 https://www.eca.europa.eu/Lists/ECADocuments/SR20_01/SR_Ecodesign_and_energy_labels_EN.pdf

Against this background, the European Union's Horizon 2020 research and innovation programme funded in 2018-2021 the project *ANTICSS – Anti-Circumvention of Standards for better market Surveillance* conducted by 19 partners of eight countries, coming from research organisations, Energy Agencies, Market Surveillance Authorities (MSAs), test laboratories, and consumer organisations.



The overall objective of ANTICSS was to assess and define circumvention in relation to EU ecodesign and energy labelling legislation and relevant harmonised standards, clearly delimit it from other effects, assess its potential impacts on projected energy savings, support capacity building for Market Surveillance Authorities and test laboratories and finally, provide recommendations for EU policy makers and European Standardisation Organisations to facilitate the identification and prevent future circumvention of the EU legislation.

The ANTICSS project was also designed to support manufacturers by identifying potentially vague points in legislation and standards, which might be interpreted differently by market actors, with some of them taking unfair advantages so far. By overall awareness raising on the topic of circumvention among stakeholders, ANTICSS intended supporting an effective EU legislation enforcement and thus increasing acceptance and trust of market actors and civil society into the ecodesign and energy labelling legislation.

3 / WHERE CIRCUMVENTION MAY HAPPEN: SCOPE AND MODEL SELECTION

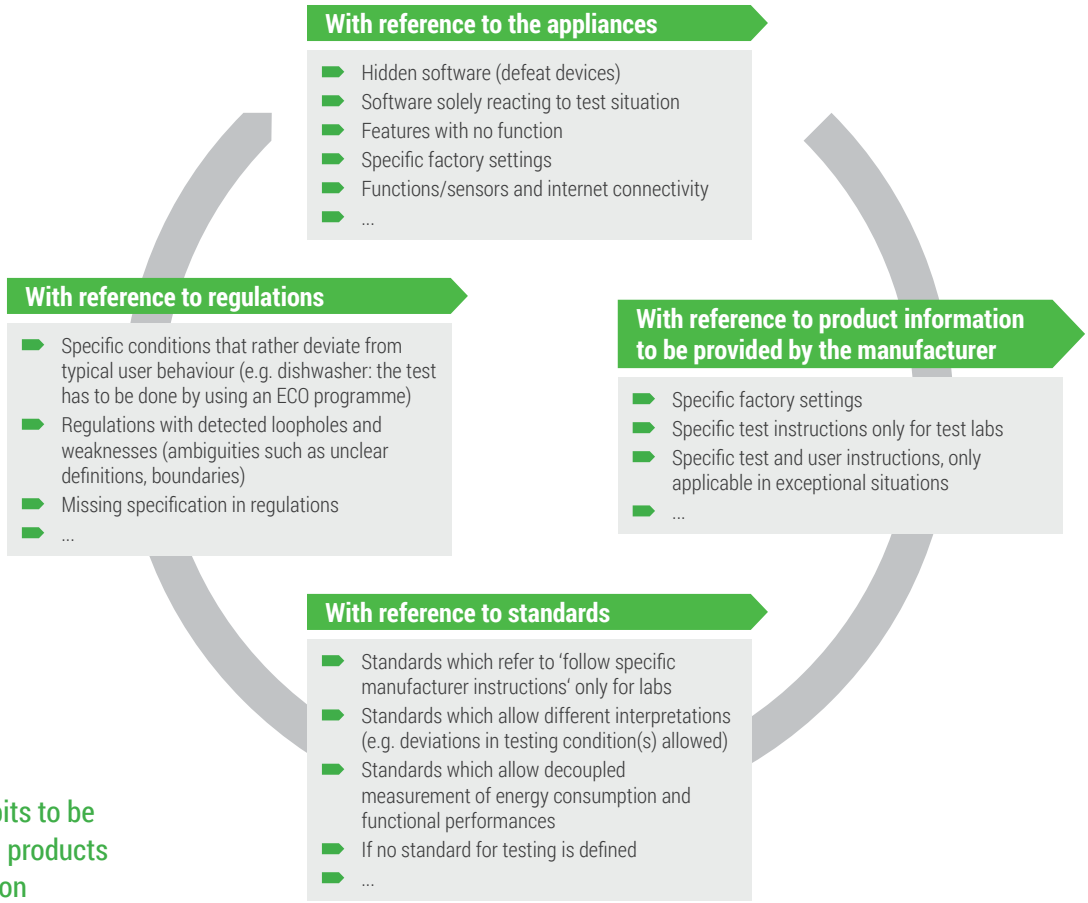
In principle, circumvention may happen in any of the energy-related product categories covered by ecodesign and/or energy labelling regulations.

The ANTICSS project decided to exclude from its actions the product categories that were not covered by a product specific regulation on ecodesign or energy labelling (i.e. product groups with Voluntary Agreements), product groups which no longer had a market relevance (i.e. almost zero sales from 2020 onwards), and product categories where no harmonised standards or transitional methods are published on the EU Official Journal.

Based on literature research, analysis of existing ecodesign and energy labelling legislation and standards, as well as a broad stakeholder consultation, approaching in total 278 experts from manufacturers, Market Surveillance Authorities, test laboratories as well as consumer and environmental NGOs, 39 cases of product suspect behaviour were collected. After an initial evaluation, 21 cases were deemed as related to non-compliant, compliant or duplicated cases. The remaining 18 cases belonging to 8 different product categories were analysed in detail and for each product category 3 different models were selected to be tested in the partner test laboratories.

How to target products with a high probability of having a circumvention behaviour

ANTICSS has compiled the following patterns or suspicious habits to be considered when targeting products more prone to circumvention:

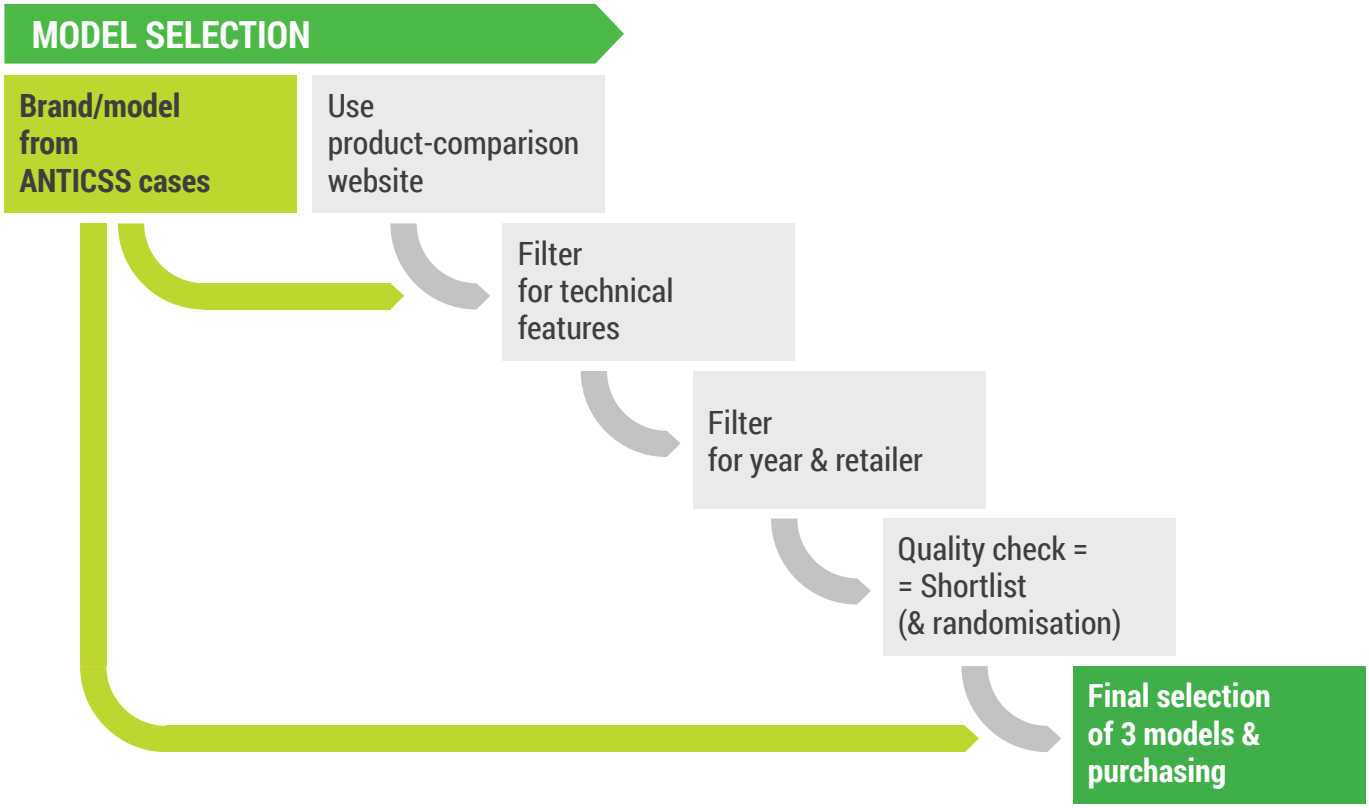


Patterns or suspicious habits to be considered when targeting products more prone to circumvention

The selection procedure applied within ANTICSS was specifically targeted at finding appliances with a high probability of having a circumvention behaviour. This means that the ultimate goal of the project was not to assess (non-)compliance to other regulatory requirements, but rather to identify if and how circumvention occurs.

In case the specific brand/model was referred to in the suspect case reported to ANTICSS, this model was selected for testing within the project. Alternatively, when no specific brand/model was known, the main search focused on models with the technical features or peculiarities associated to the product reported with the suspected behaviour.

To avoid unnecessary redundancy, it was assured that the three models to be tested were not too similar (e.g. variations of the same product model within the same brand), or equivalent (e.g. same model sold under different brand/model names). Models with a higher energy efficiency class were primarily selected as they were deemed to be more likely prone to circumvention due to higher pressure on the manufacturer to achieve the highest positioning of these models.



ANTICSS model selection procedure specifically targeted at finding appliances with a high probability of having a circumvention behaviour

4 / BEYOND DEFEAT DEVICES: A BROADER UNDERSTANDING OF CIRCUMVENTION AND JEOPARDY EFFECTS

After the issue of circumvention entered the policy agenda, a specific article on circumvention was introduced in the EU ecodesign regulations published from 2019 onwards:

Circumvention

The manufacturer, importer or authorised representative shall not place on the market products designed to be able to detect they are being tested (e.g. by recognising the test conditions or test cycle), and to react specifically by automatically altering their performance during the test with the aim of reaching a more favourable level for any of the parameters declared by the manufacturer, importer or authorised representative in the technical documentation or included in any of the documentation provided.

Article on circumvention used in the EU ecodesign regulations published from 2019 onwards

The focus is on products programmed to recognise the test situation and *automatically* optimise the performance and/or resource consumption when they are tested. In addition, Recital (35) and Article 3 of the energy labelling framework regulation (EU) 2017/1369 explicitly mention that methods and standards should deter intentional and unintentional circumvention, and prohibit the inclusion of software or hardware that *automatically* alters the performance of a product in test conditions.

The ANTICSS project has extensively investigated the possibilities for circumvention. Based on literature research, analysis of existing legislation and standards on ecodesign and energy labelling, as well as the cases of suspicious product behaviour collected during the stakeholder consultation, the analysis showed that circumvention does not happen only by automatically detecting the test situation and changing the product performance during the test, as already prohibited in some ecodesign and all energy labelling regulations.

Better test results can also be achieved by making certain pre-settings or manual alterations to the product that apply during the test situation. Often, harmonised standards include a general reference to manufacturer's instructions to allow the preparation of the product for the laboratory test. This can be necessary, e.g. for safety reasons or repeatability and reproducibility of the test results. However, if such instructions are prescribed exclusively to test laboratories without a comprehensible reason and alter the product behaviour to optimise its performance specifically under testing, the ANTICSS project identifies this as a misuse of manufacturer's instructions and an act of circumvention as well.

A third way of circumvention could be by programming products to show very good energy efficiency or functional performance and/or resource consumption for the time in which a conformity verification test is expected, or for a predefined number of cycles. At the time of placing on the market the product is programmed in a way to make it compliant if selected by a Market Surveillance Authority for compliance verification, but then to automatically change its performance a certain time after it is put into service. The automatic modification does not take place during the period in which the verification of the compliance is expected, but only afterwards, for example to ease the restrictions imposed by compliance with the regulatory requirements and make the product more attractive to end users in the real-life use, but also less efficient or performing compared to when initially placed on the market. The software responsible of the automatic modification is already present in the delivered product, i.e. not provided subsequently via a software update.

On the basis of all collected information, the ANTICSS project developed a more comprehensive definition of circumvention, including all three identified possible routes:

Circumvention is the act of designing a product or prescribing test instructions, leading to an alteration of the behaviour or the properties of the product, specifically in the test situation, in order to reach more favourable results for any of the parameters specified in the relevant delegated or implemented act, or included in any of the documentations provided for the product.

The act of circumvention is relevant only under test conditions and can be executed, e.g.,

*a) by **automatic detection** of the test situation and alteration of the product performance and/or resource consumption during test, or*

*b) by **pre-set or manual alteration of the product**, affecting performance and/or resource consumption during test or*

*c) by **pre-set alteration of the performance within a short period** after putting the product into service.*

ANTICSS definition of **circumvention**

In several of the cases collected by the ANTICSS project the products' behaviour was not clearly attributable to the above definitions of circumvention but was nevertheless still suspicious. Against this background, the ANTICSS project developed the concept of jeopardy effects. These refer to product behaviour that is not circumvention and thus cannot be considered non-compliant but allows a distortion of the test results due to the exploitation of loopholes or other weaknesses in standards or regulations.

Jeopardy effects encompass all aspects of products or test instructions, or interpretation of test results, which do not follow the goal of the EU ecodesign and/or energy labelling legislation of setting ecodesign requirements and providing reliable information about the resource consumption and/or performance of a product.

These effects may be not classified as circumvention but become possible due to loopholes or other weaknesses in standards or regulations.

ANTICSS definition of **jeopardy effects**

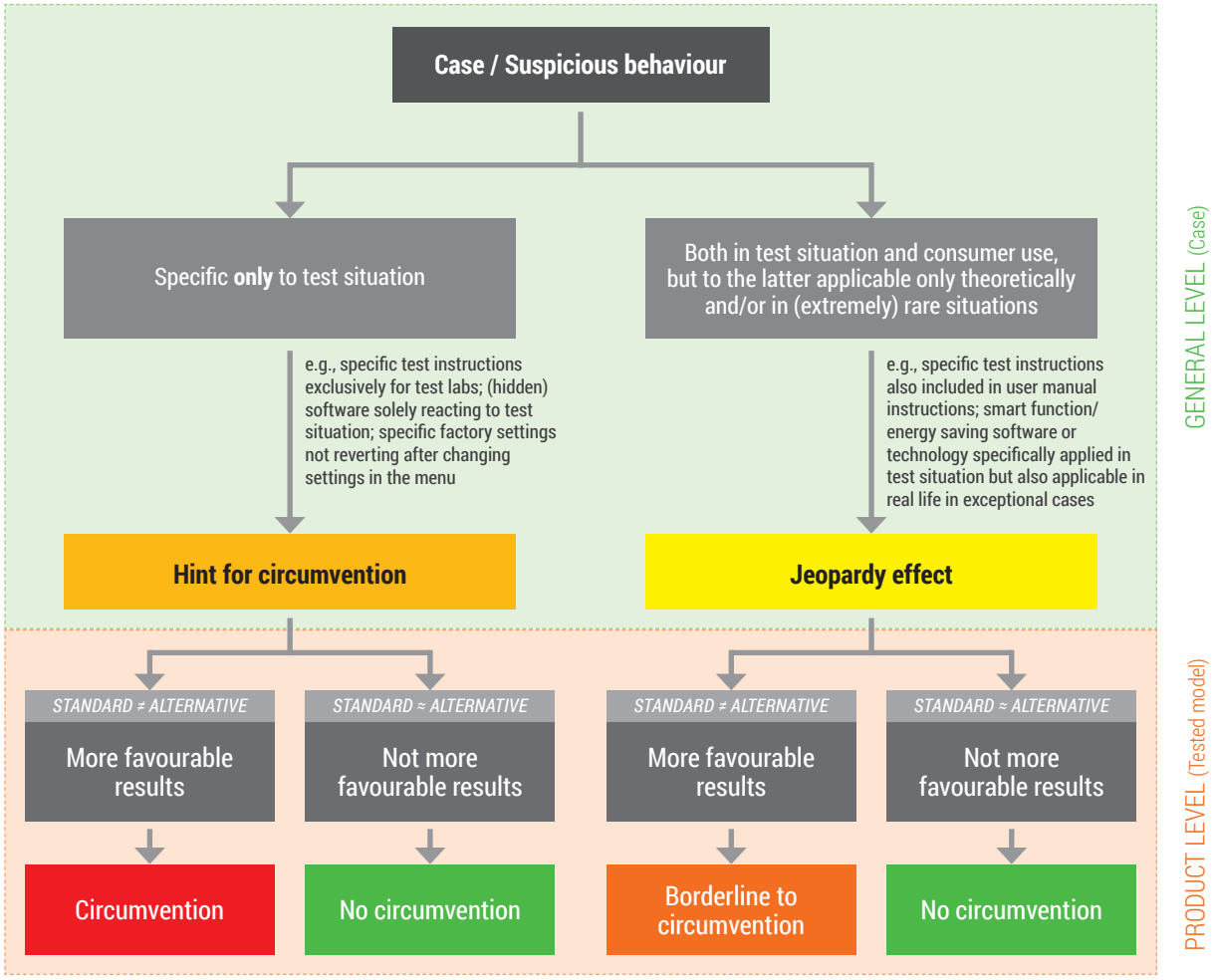
The cases of suspected product behaviours initially reported to the project by Market Surveillance Authorities, test laboratories or other stakeholders, were differentiated and classified by ANTICSS between hints for circumvention and jeopardy effects as shown in the below picture:

Hints for circumvention *(case level): Initially reported cases where the suspected behaviour leads to more favourable results exclusively during the test situation but not during consumers' use in real life. If such act was then proven by laboratory testing in ANTICSS, the tested model (product level) is categorised as* **circumvention** .

Examples are specific test instructions provided exclusively for test labs, (hidden) software solely reacting to the test situation, or specific factory settings not reverting after changing the settings in the menu.

Jeopardy effects *(case level): Initially reported cases where the suspect behaviour occurs both in the test situation and in real life, but to the latter applicable only theoretically or in (extremely) rare situations. If such act was then proven by laboratory testing in ANTICSS, the tested model (product level) is categorised as* **borderline to circumvention** .

Examples are specific test instructions also included in the user manual instructions; or energy or resource saving software or technologies which are only applicable in exceptional cases in real life, whereas they are fully considered in the test situation. These acts are not relevant only under test conditions, but nevertheless, the design of the product or the test instructions result in more favourable results especially, but not exclusively, in the test situation.



ANTICSS differentiation between 'hints for circumvention' and 'jeopardy effects' and respective categorisation of tested models to 'circumvention' or 'borderline to circumvention'

On the other hand, not every initially suspected case was categorised as circumvention or jeopardy effect. The ANTICSS project provided clear delimitations of circumvention and jeopardy effects from non-compliance, missing representativeness of standards, golden samples, products designed for being out of scope, smart products in general as well as software updates.

5 / TRACING CIRCUMVENTION: THE NEED FOR 'MODIFIED' TEST PROCEDURES

Circumvention is a special case of non-compliance

Market Surveillance Authorities can detect the non-compliance by inspecting the product documentation and/or by laboratory testing, using the measurement methods defined in the harmonised standards. The information and test results are compared with the requirements laid down in legislation and the same standards. If they do not meet these requirements the product is non-compliant.

In case of circumvention the product does not immediately appear to be non-compliant. The product appears to comply with all requirements when tested according to the applicable harmonised standards. However, this is because the product itself or its settings have been manipulated so that the test results are influenced in such a way that they turn out more favourable precisely under the harmonised standard test conditions. For this reason, it is rather impossible to detect circumvention behaviour with the standard measurement methods harmonised for the regulations.

This is one of the most important findings of the ANTICSS project as it shows the need for a new approach to compliance verification that requires the definition of 'modified' measurement methods.

ANTICSS modified test methods

ANTICSS developed and applied modified test methods for several suspicious cases that were initially collected or reported to the project.

The main characteristics of the modified test methods specifically addressing circumvention are that only the parameters of the test conditions of the applicable harmonised standard(s) considered prone to manipulation or under suspect of manipulation are slightly varied. At the same time, the modified test methods are still designed to be as close as possible to the harmonised standards, with the aim of ensuring comparability between the two sets of measurement results.

General examples of ANTICSS modified test methods

Standard test condition	Potential circumvention	ANTICSS modified test method
Rather fixed ambient conditions (e.g. narrow voltage, frequency, or temperature ranges)	Appliances might be programmed in a way to detect being under test and automatically alter the performance to gain more favourable results specifically during standard test conditions.	Slight variation of the ambient conditions. ANTICSS examples: household tumble driers, household washing machines, household refrigerators and freezers
Testing at fixed loads (rather few load points specified in the standard test conditions)	Appliances might be programmed in a way to detect these standard load points and automatically alter the performance to gain more favourable results specifically during standard test conditions.	Slight variation of the standard load points. ANTICSS example: washing machines

General examples of ANTICSS modified test methods		
Standard test condition	**Potential circumvention**	**ANTICSS modified test method**
Possibility of **specific instructions** or **accessories applicable under standard test only**	Appliances might achieve the declared performance parameters only under the specific instructions.	Testing without or with slightly changed specific instructions or accessories. ANTICSS examples: household dishwashers, household refrigerators and freezers, household tumble driers, ovens.
Testing at factory settings	Appliances might be programmed in a way to achieve more favourable results specifically at initial factory settings during standard test conditions whereas these results will not be achieved after changing the settings in the menu for the first time and resetting to the factory settings again.	Testing with slight deviations from the factory settings and afterwards testing at reset factory settings. ANTICSS example: televisions.
Decoupled testing of energy efficiency and performance measurement	Appliances might be programmed in a way to detect being under test and being optimised to achieve more favourable results specifically regarding the energy efficiency by reducing or not fulfilling the product's performance during that (separate) test cycle.	Testing the product's performance also during the energy efficiency test cycle. ANTICSS example: ovens.
Cycle based appliances to be tested for a defined number of test rounds as specified in the related standards	Appliances might be programmed to perform the pre-set number of cycles with consuming significantly less resources and automatically alter the properties after this number of standard cycles.	Testing a certain number of cycles beyond the defined number of cycles in the standard. Not tested within ANTICSS.

It must be noted that within the ANTICSS project no analysis was developed to prove that the modified test methods deliver (i) repeatable and reproducible results which are (ii) directly comparable with the results achieved with the harmonised standards. Nevertheless, according to the ANTICSS project's experts the specifically chosen and well documented deviations of the ANTICSS modified test methods from the harmonised standards do not generally result into substantial deviations of the results from those obtained when tested according to the harmonised standard test conditions. Therefore, the ANTICSS project considers that the harmonised standard and the modified test method as well as the achieved test results, although not usable for compliance verification, are in principle broadly comparable for the purposes of the project.

Inexplicable test results as indicator for potential circumvention acts

The ANTICSS project considered that, if the modified measurement method leads to **inexplicable** changes in the measurement results compared to the same results achieved with the harmonised standard test method, this may indicate that the product might have been specifically altered to detect, or manipulated to be optimised for, the harmonised standard test conditions.

As a reference for determining the significance of the deviation between the results achieved under the two testing conditions, ANTICSS used the verification tolerances of the tested parameters as provided in the EU ecodesign and energy labelling regulations for market surveillance purposes. If the deviation exceeded the magnitude of the verification tolerances, the result of the modified measurement method is considered significant and thus worth a specific analysis and thorough interpretation to understand if consequence of circumvention.

6 / FROM PRACTICE: ANTICSS RESULTS OF LABORATORY TESTING

The following overview summarises the ANTICSS test results and respective categorisation of 24 tested models, covering 18 cases in 8 different product categories.

ANTICSS colour legend

GENERAL LEVEL (Reported case)		PRODUCT LEVEL (Model tested in ANTICSS)	
YELLOW	**Jeopardy effect**	GREEN	**No circumvention**
ORANGE	**Hints for circumvention**	DARK ORANGE	**Borderline to circumvention**
		RED	**Circumvention**

ANTICSS test results

	PRODUCT LEVEL (Tested model)		
GENERAL LEVEL (Reported case)	**Model A**	**Model B**	**Model C**
Household dishwashers Specific loading instructions (removal and relevant alteration of accessories) exclusively provided to test lab, i.e. not to consumers, to reach the declared capacity (hint for circumvention)	Model not tested for this case	Model not tested for this case	Circumvention
Televisions Specific factory settings (brightness), not reverting to its low energy consumption after changing factory settings in the menu (hint for circumvention)	No circumvention	No circumvention	No circumvention
Household dishwashers Separate bowl exclusively provided to test laboratory for standard test, not to consumers (hint for circumvention)	No circumvention	Model not tested for this case	Model not tested for this case
Household dishwashers Specific instruction (dedicated pre-treatment cycle) on how to adjust the appliance for the standard test, exclusively provided to test institutes (hint for circumvention)	Model not tested for this case	No circumvention	Model not tested for this case
Household tumble driers Specific instruction (dedicated number and type of pre-treatment cycles) on how to adjust the appliance for the standard test, exclusively provided to test institutes (hint for circumvention)	No circumvention	Model not tested for this case	Model not tested for this case
Household tumble driers & Household washing machines White goods may theoretically comprise hidden software/sensors to detect the specific ambient testing conditions of the standard test and run specific algorithms that might result in e.g. lower resource consumption or better performance values (hint for circumvention)	No circumvention	No circumvention	No circumvention

	PRODUCT LEVEL (Tested model)		
GENERAL LEVEL (Reported case)	**Model A**	**Model B**	**Model C**
Household washing machines Optimisation of the appliance specifically for the full and half rated capacity of the standard test (jeopardy effect)	No circumvention	No circumvention	Borderline to circumvention
Domestic ovens Specific recipe (e.g. yogurt making) in user instructions that requires removing the shelf-guides for the volume measurement (jeopardy effect)	Borderline to circumvention	Model not tested for this case	Borderline to circumvention
Domestic ovens Decoupled energy and temperature (performance) measurement in standard test; lowered temperature always during energy consumption measurement, whereas stable set temperature during subsequent temperature measurement (jeopardy effect)	Model not tested for this case	Borderline to circumvention	No circumvention
Refrigerating appliances Holiday mode / eco-mode to reduce energy consumption, fully accounted in standard test whereas seldom in real life (jeopardy effect)	No circumvention	No circumvention	Borderline to circumvention (equal to case on screen switch-off function)
Refrigerating appliances Screen switch-off function to reduce energy consumption, fully accounted in standard test whereas seldom in real life (jeopardy effect)	Model not tested for this case	Model not tested for this case	Borderline to circumvention
Televisions Automatic backlight reduction function fully accounted in standard test whereas extremely rarely in real life (jeopardy effect)	No circumvention (function applied, but not misused to declare better results)	No circumvention	No circumvention
Domestic ovens The standard allows the setting of a lower temperature if the oven is not capable to perform the maximum requested temperature. This situation implies lower energy consumption results for ovens not being able to reach these temperatures – a situation of which manufacturers might take advantage. The ANTICSS modified procedure, proposing a reduction of the temperature in the centre of the oven showed that this finally had very low impact on the energy consumption, i.e. the initial classification of this case as jeopardy effect has not been confirmed.	Model not tested for this case	No circumvention	No circumvention
Dishwashers Additional water and energy consumption of the cleaning operations of water tank machines is not fully accounted to the overall consumption (missing representativeness of the standard)	Model not tested for this case	No circumvention	Model not tested for this case
Room air conditioners (defrost cycles) Manufacturers may declare efficiencies for the products on the energy labels and supporting data sheets considerably higher compared to what have been measured in real installations, especially in cold and humid climates, which in such case would give the consumer misleading information (missing representativeness of the standard)	Results not assessable	No circumvention	No circumvention
Room air conditioners & Space heaters (variable speed compressor) Manufacturers may declare efficiencies for the products on the energy labels and supporting data sheets considerably higher compared to what have been measured in real installations, especially in cold and humid climates, which in such case would give the consumer misleading information (missing representativeness of the standard)	Results not assessable	Results not assessable	Results not assessable

For some of the reported cases, no circumvention could be proven for the selected models analysed in laboratory testing. Still, the cases were classified as hints for circumvention or jeopardy effects as they could apply to other models on the market not yet tested, thus could serve as indicator to MSAs at which cases to look in more detail.

6.1 / DISHWASHERS – SPECIFIC LOADING INSTRUCTIONS

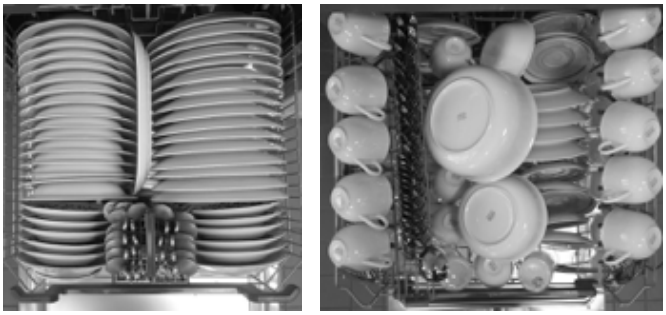
Standard EN 50242:2016 for measuring the performance of electric household dishwashers, states that *The dishwasher manufacturer's instructions regarding installation and use shall be followed.* The testing of one of the three analysed dishwasher models following the manufacturer's instructions according to the harmonised standard required the removal or change of the position of many of the accessories that were fitted to the appliance as supplied. Instructions, e.g. removal of a third rack or alteration of relevant parts (e.g. split of cutlery basket into two parts at different positions) were exclusively given in the instructions for test laboratories, and not in the user instructions; therefore, this case was categorised as hint for circumvention.

The ANTICSS modified tests were conducted also according to the harmonised standard EN 50242:2016 and following manufacturer's instructions but without removing or altering the accessories. The loading scheme was applied with the maximum number of place settings and corresponding serving pieces that fit in the machine as delivered. With this modified loading scheme and all accessories kept in place in the machine, only 12 instead of 16 place settings could be fitted into the dishwasher, i.e. the number of loadable place settings was reduced by 25%.

HARMONISED STANDARD: Standard loading scheme according to manufacturer's instructions:

Many accessories and third rack had to be removed, cutlery basket split into half

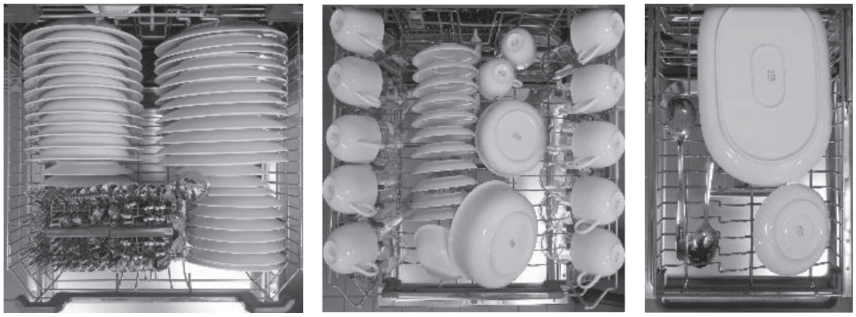
16 place settings declared



ANTICSS ALTERNATIVE LOADING SCHEME

Machine tested as supplied

12 place settings achievable



ANTICSS testing of a dishwasher model: harmonised standard and modified loading scheme

Although the absolute water consumption did not change and the total energy consumption was slightly lower (-3.2%) compared to the test results in the configuration for 16 place settings due to the reduced weight of the load, the specific energy and water consumption per place setting increased by 29% and 34% respectively. For consumers, this means that in real life only 12 instead of the declared 16 place settings could be loaded and cleaned, which results in more cycles needed per year to clean the same number of dishes, i.e. increases their annual energy and water consumption.

ANTICSS TEST RESULTS / **DISHWASHER**			
	Harmonised standard measurement method	**ANTICSS modified measurement method**	**Deviation**
Standard place settings (ps)	16	12	-25%
Specific energy consumption (Wh/ps)	47.2	60.9	+29%
Specific water consumption (L/ps)	0.68	0.91	+34%
Energy efficiency class	A+++	A+++	No difference

Considering that the manufacturer's instructions regarding the loading scheme are exclusively provided for test laboratories, the product is considered as manually altered, and the resource consumption affected only during the laboratory testing. The deviation of the specific energy and water consumption exceeded the verification tolerances; therefore, the result of the modified test method is considered significant and the tested model is categorised as circumvention.

The loading capacity is one of the declared parameters on the energy label and thus a purchase criterion for consumers. Since the loading capacity is also used to calculate the energy efficiency index, a higher loading capacity might help reaching a better energy efficiency class, although this was not the case for the specific model tested within ANTICSS.

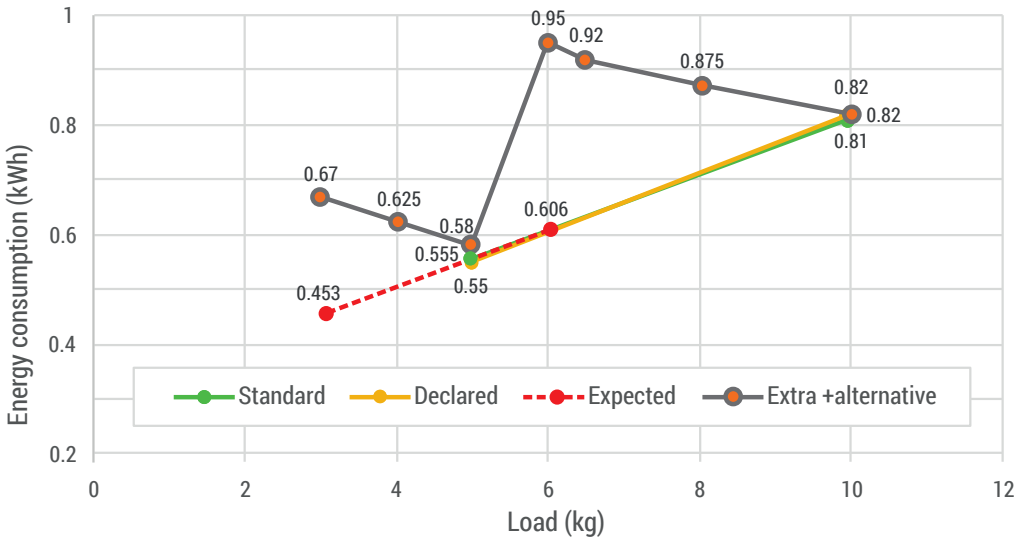
6.2 / WASHING MACHINES – SPECIFIC OPTIMISATION AT FULL AND HALF RATED CAPACITY

According to harmonised standard EN 60456:2016, for washing machines a series of seven tests have to be carried out with three different treatments for the standard programmes: Half load: two test runs at treatment 40°C and two test runs at treatment 60°C; and full load: three test runs at treatment 60°C. The suspect was that washing machines might be optimised in a way to present more favourable results for the energy and water consumption exactly at the two testing points of full and half load as specified in the harmonised standard, whereas the consumption values follow a different pattern when the machine is run at different loads.

For the ANTICSS modified testing procedure, the tests were also performed according to EN 60456:2016 but with a reduced load of 6 kg instead of the full load of 10 kg as declared by the manufacturer and with a half load of 3 kg (instead of 5 kg). The results for one of the three tested models suggested that this washing machine might be optimised specifically for the standard loads. So, the ANTICSS consortium decided to perform additional tests at 4 kg, 6.5 kg and 8 kg at 60°C treatment to better understand the machine's behaviour. The results were striking:

- The energy consumption values at loads lower than half rated capacity of 5 kg (0.55 kWh) were higher (0.63 kWh at 4 kg and 0.67 kWh at 3 kg) and also the energy consumption values at loads lower than full rated capacity of 10 kg (0.81 kWh) were higher (0.88 kWh at 8 kg, 0.92 kWh at 6.5 kg and 0.95 kWh at 6 kg)
- There was a significant, inexplicable increase of the energy consumption from 0.55 kWh at 5 kg to 0.95 kWh at 6 kg load.

ANTICSS results of a washing machine model: energy consumption of the 60°C standard programme using different loads



The increasing energy consumption at lower loads is remarkable as it could rather be expected that the energy consumption of the washing machine would rise with increasing wash load or getting lower with smaller loads (note: a linear dependency of the washing machine's energy consumption to the load is an approximation introduced by the ANTICSS project for sake of simplicity although it is well known that the usual relation is not linear).

The tested model could be categorised in two different ways:

- borderline to circumvention, assuming that the more efficient test results for the energy and water consumption more or less exactly at full and half rated capacity (compared to different loads in-between) would also be achieved in real life when consumers load the machine around these capacities.
- circumvention, imagining that the model could have a sensor that automatically detects the weight of the load, and being programmed in a way that if the weight corresponds to the exact load used in the standard test (full and half load of the rated capacity, standard garments), the energy and the water consumption would be reduced exclusively under these standard test conditions, but not in consumer use.

This case gives strong indications how products whose performance varies with capacity can be optimised towards a legislation setting a limited number of capacities as representative of the overall product performance.

6.3 / OVENS – VOLUME MEASUREMENT WITHOUT SHELF GUIDES

Standard EN 60350-1:2016 for measuring the performance of household electric cooking appliances states for measuring the volume: *Removable items specified in the user instructions to be not essential for the operation of the appliance in the manner for which it is intended shall be removed before measurement is carried out.* In one of the three tested oven models, the user instructions contained one specific recipe for making yoghurt, which indicated that it is necessary to remove the accessories and shelves and that the cooking compartment must be empty. Due to this specific recipe in the user instructions, the standard test of the volume had to be done removing all shelf guides. The ANTICSS modified test method was conducted also according to standard conditions of EN 60350-1:2016, except the volume was measured with the shelf guides in their position.

In the modified measurement method, the volume with shelf guides included was lower (9 litres or around 13%) than in the tests developed following the harmonised standard without the shelf guides. The measured energy consumption was the same for the two tests. However, the difference in the volume had an impact on the calculated Energy Efficiency Index (EEI), which was 5% higher (i.e. more favourable) than under the test conditions of the harmonised standard. For the tested model, however, the higher EEI did not result in a change of the energy efficiency class.

ANTICSS TEST RESULTS / **OVEN**			
	Harmonised standard measurement method	**ANTICSS modified measurement method**	**Deviation**
Volume (L)	71	62	-13%
Energy consumption (kWh/cycle)	0.71	0.71	0%
Energy Efficiency Index	83.5	87.7	+5%
Energy efficiency class	A	A	No difference

The inclusion of a recipe where the shelf guides are not needed (which is then the setting of the oven for the standard test) was not exclusively provided in the instructions for test laboratories but also included in the user instructions. This provides the possibility of such a setting in real-life use. Nevertheless, the use of an oven without shelf guides seems to be an exceptional use and not the operation of the appliance in the manner for which it is usually intended, so it remains suspected that the inclusion of such a recipe is intended to achieve more favourable results specifically under testing; the case is categorised as jeopardy effect. The deviation of the volume exceeded the verification tolerances, i.e. the result of the modified test is considered to be significant and the tested model is categorised as borderline to circumvention.

The volume of ovens is one of the declared parameters on the energy label, i.e. purchase criterion for consumers. Since the volume is also used to calculate the Energy Efficiency Index, a higher volume might help reaching a better energy efficiency class, although this was not the case for the specific model tested within ANTICSS.

6.4 / OVENS – AUTOMATIC TEMPERATURE REDUCTION FUNCTION

The first step of the test cycle according to EN 60350-1:2016 for measuring the performance of household electric cooking appliances, the energy consumption measurement, is done with a brick (soaked up with water to simulate a piece of beef) loaded in the centre of the oven. In the second step, a consecutive temperature measurement of the empty oven is done. Between the two steps, the door necessarily must be opened to remove the brick. To measure the energy consumption of the oven in the first step, a certain temperature-rise as defined in the standard must be reached in the centre of the brick.

The results of the ANTICSS testing for one of the three tested models revealed a suspect behaviour: During the first step (energy consumption measurement) in the ECO mode, the temperature in the oven was considerably lower than the targeted temperature setting: the total length of the first step was 54 minutes, but the temperature of the centre of the oven was around the set temperature of 190°C for only approx. 20 minutes. Then, the temperature dropped down to 89°C, whereas the expected and normal behaviour of an oven would be to maintain the set temperature of around 190°C for most of the time. The temperature was only increased again after the door was opened to remove the brick. In the second step (temperature measurement), the temperature remained stable during the test period.

ANTICSS results of an oven model in ECO mode: energy consumption measurement (step 1) and temperature measurement (step 2)

In a tested non-ECO mode ('fan assisted' mode) of the same model, the temperature in the centre of the oven remained stable for both the energy consumption measurement and the temperature measurement. In addition, the second oven model tested for this case did not show this behaviour: both in the ECO and in the 'conventional with fan' mode the temperature in the centre of the oven remained stable for both steps.

It seems that the ECO mode of the first model has been specifically designed to reach lower, i.e. more favourable, values for the energy consumption by reducing the temperature while still maintaining the target temperature rise in the centre of the brick. Only *after* the first hour, i.e. usually when the testing of the energy measurement is finished, the temperature remained stable at the required temperature setting. Probably the opening (and re-closing) of the oven door in the tests according to the harmonised standard or, alternatively, a certain pre-set period of time, triggered the temperature to increase so that the required temperature value could be reached for the subsequent temperature measurement.

It is assumed that the temperature decrease does not apply exclusively during the test situation but occurs always during the first hour, i.e. applicable both in the test situation and during consumer use in real life; thus, the case was categorised as jeopardy effect. The temperatures of the modified measurement method are deviating significantly from the requirement included in the harmonised standard and therefore the tested model was categorised as borderline to circumvention.

6.5 / REFRIGERATING APPLIANCES – SCREEN SWITCH-OFF FUNCTION

Standard EN IEC 62552:2013 for measuring the performance of household refrigerating appliances states: *The refrigerating appliance shall be set up as in service in accordance with the manufacturer's instructions.*

For the tested refrigerating model, the display of a controller, providing a digital clock, was activated each time the door was opened. In case the consumer is away for a longer period, the cabinet can save energy by disabling the display after 24 hours. The appliance did not have a functionality to turn off the display permanently. It only controlled whether the display remains always on or is turned off after 24 hours without door opening detection; it was not possible to increase or shorten this time in the settings. The user instructions state to leave the screen switch-off function in the pre-set value (i.e. turn-off after 24 hours without door openings) in order to save energy and in case that the pre-set switch-off function is disabled the energy consumption will slightly increase.

Therefore, the test according to the harmonised standard was done with the screen switch-off function enabled, i.e. automatic turn-off after 24 hours without door openings. As the harmonised standard does not include any door openings the display will be permanently turned off during the test, whereas in everyday life, the display will be activated most of the time due to the normal use of the refrigerator with daily door openings.

For the ANTICSS modified measurement method, the input power of the display was measured separately during an off cycle of the cooling system, while switching the display on and off. The difference of the measured input power (2.1W) was attributed to the display. The annual energy consumption of the appliance was then calculated by adding the energy consumption of the activated display (estimating 20 days of absence per year with the display being deactivated) to the annual energy consumption measured with the harmonised standard.

ANTICSS TEST RESULTS / **REFRIGERATOR**

	Harmonised standard measurement method	ANTICSS modified measurement method	Deviation
Energy consumption (kWh/year)	169	186	+10.3%
Energy Efficiency Index	20.3	22.4	+10.3%
Energy efficiency class	A+++	A++	1 class

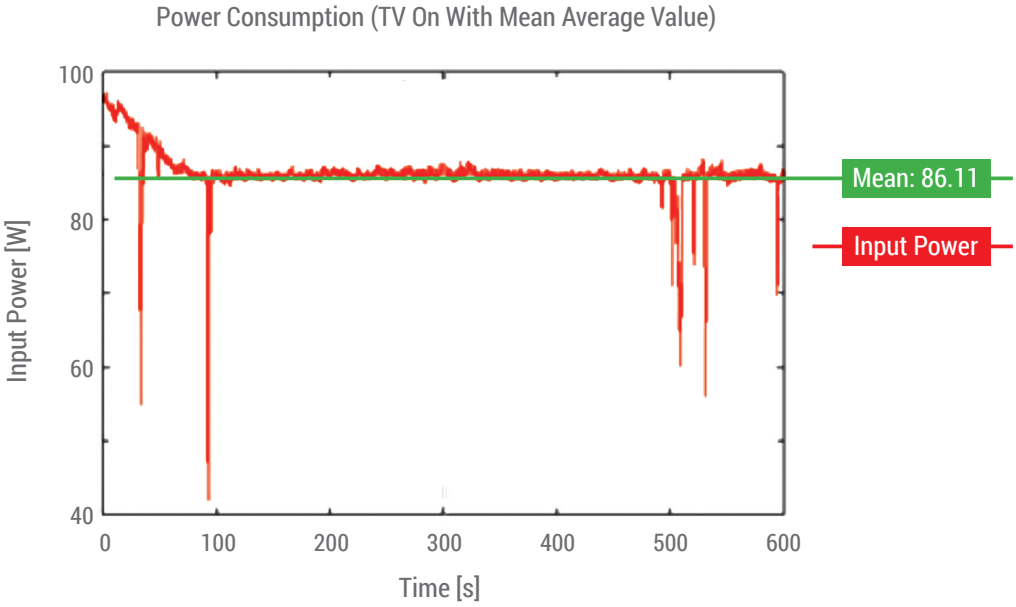
The results show that there would be an additional energy consumption of around 17 kWh/year due to the display, which cannot be switched off manually or via a modification of the setting. This is an increase of 10.3% compared to the energy consumption resulting from the test with the harmonised standard. The energy efficiency class would change from an A+++ to A++.

During the testing according to the harmonised standard the appliance is operated as if the consumer were not at home and deactivated the display to save energy. Thus, the measured and the declared energy consumption represent the most efficient mode of the appliance as captured by the specific test conditions which does not include any opening of the doors, which is not providing an optimum proxi of the actual use and energy consumption during real life. The turn-off of the display does not apply exclusively during the test situation but occurs also during consumer use, e.g. when the consumer is absent for a holiday period; thus, the case is categorised as jeopardy effect. The deviation of the energy consumption of the tested model exceeded the verification tolerances, i.e. the result of the modified test method was considered significant and the tested model was categorised as borderline to circumvention.

6.6 / TELEVISIONS – AUTOMATIC BACKLIGHT REDUCTION FUNCTION

It is well known among experts that the test video to be used for the standard measurement according to IEC 62087-2:2015 for the determination of the power consumption of audio, video, and related equipment such as televisions includes hard cuts every few seconds, i.e. fast moving images which are very different from the characteristics of real-life broadcast content. This pattern might facilitate the device recognising this sequence as a test video and implementing special functions to reduce for example the luminance (backlight) during this loop to decrease the power consumption specifically in the test situation.

For one of the three models tested in ANTICSS, the results according to the harmonised standard showed that the model indeed has a special function to detect fast changing content: the backlight (finally the input power) was reduced step by step starting at about 95 W at the start of the test video and settling down at about 85 W after 100 seconds for the rest of the 10 minutes test sequence. The two other models tested in ANTICSS did not present any backlight reduction function.



ANTICSS results of modified test method of a TV model using an automatic back-light reduction function

At the case level, this could be either classified as jeopardy effect – following the manufacturer's explanation that the function is also applicable to any content in real life that entails rapid scene changes and/or depicting a large amount of motion such as sports programmes; or as hint for circumvention – based on the experience of the test laboratory that such fast moving pictures never apply in real life, i.e. the software exclusively reacts to the specific fast-moving images of the standard test video, although this fact could not be proven by ANTICSS.

In principle, such a backlight reduction function can be used to gain more favourable results for the measured values and therefore also for the declared ones of the on-mode and annual power consumption. However, for the specific model tested in ANTICSS this did not occur – on the contrary: the declared values for the on-mode and annual power consumption were significantly higher, 23% worse than the results of the measured values, even resulting in a declared lower energy efficiency class A instead of the A+ that can be derived from the measured values. Therefore, the specific tested model was not categorised as circumvention.

ANTICSS TEST RESULTS / **TELEVISION MODEL**			
	ANTICSS Harmonised standard test results	**Declared by manufacturer**	**Deviation**
On-mode power consumption (W)	85	110	-23%
Annual power consumption (kWh/year)	118	153	-23%
Energy efficiency class	A+	A	1 class

According to the manufacturer, this over-declaration of power consumption is a safety margin due to the variations between units due to the construction process, to ensure all units being compliant with energy efficiency class A when verified by Market Surveillance Authorities.

7 / FROM INDIVIDUAL MODELS TO A GENERAL RISK: BASIC BEHAVIOURS AND GATEWAYS TO CIRCUMVENTION

From the ANTICSS test results of the individual models, the following common ways towards circumvention were identified, considered to be generally applicable to several models and product categories:

Common circumvention behaviours applicable to several models and product categories

- Influencing parameters used for the calculation of the Energy Efficiency Index (EEI) and thus also determining the energy efficiency class; for example: volume or capacity of the appliance.
- Smart or energy saving functions that are fully credited in the standard test procedure to reduce the energy consumption while in practice only theoretically or very rarely applicable.

Weaknesses in legislation and harmonised standards serving as gateway for circumvention

- Harmonised standards entailing very specific conditions and significantly deviating from typical user behaviour increase the likelihood that manufacturers design products to adapt to these test conditions to achieve more favourable results. Examples: testing refrigerators without door openings; testing televisions by using a standard test video with fast-moving pictures being extremely rare in real-life broadcasting content.
- Lack of performance requirements in legislation can be used to optimise the energy efficiency at the expense of the functional performance of the appliance. In addition, the decoupled measurement of the energy (and water) consumption and the functional performance, i.e. in different cycles, configurations, settings, or even different test conditions increases the risk of products being set to decrease the energy consumption at the expenses of the product's functional performance. Example: measuring the energy consumption of ovens without simultaneously measuring the reached temperature (considered as indication of the reachable cooking/baking performance).
- Missing specification and definition of standard programme(s) to be used for the measurement of the energy and functional performance leaving the possibility for manufacturers to declare the programme(s) to be used for compliance assessment and verification.

8 / WHAT IS LOST: IMPACTS OF CIRCUMVENTION

For the models categorised either as circumvention or borderline to circumvention on the basis of the ANTICSS test results the following impact scenarios were calculated:

- **The realistic circumvention scenario:** the minimum and maximum possible losses of potential energy savings are calculated on the basis of the combined knowledge of the market shares of the technical features of the considered appliances, and the estimated market share of the products probably showing the circumvention behaviour coming from experts from Energy Agencies, MSAs, test laboratories or standardisation bodies. In case this information was not available, a conservative market share of 5% was estimated for the realistic minimum scenario.
- **The extensive circumvention scenario:** the possible losses of potential energy savings are calculated considering all products that have the same technical feature responsible for the identified circumvention behaviour and are thus theoretically prone to the same type of circumvention.

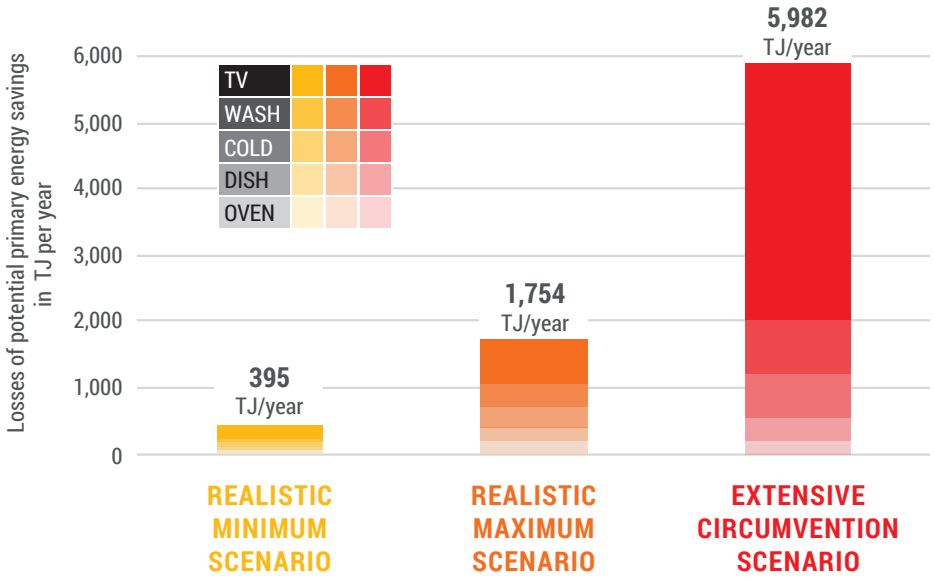
According to the ANTICSS impact assessment about 395 to 1,754 TJ (realistic minimum and maximum scenario) or 5,982 TJ (extensive scenario) of primary energy savings could be lost per year due to the circumvention or borderline to circumvention behaviour of the considered product categories, corresponding to a range of 13,300 to 201,800 tons of CO_2 equivalents[3]. Over the total lifespan of the appliances this would amount to around 2.4 million tonnes of CO_2 equivalents.

TOTAL POSSIBLE ANNUAL IMPACTS DUE TO CIRCUMVENTION OR BORDERLINE TO CIRCUMVENTION

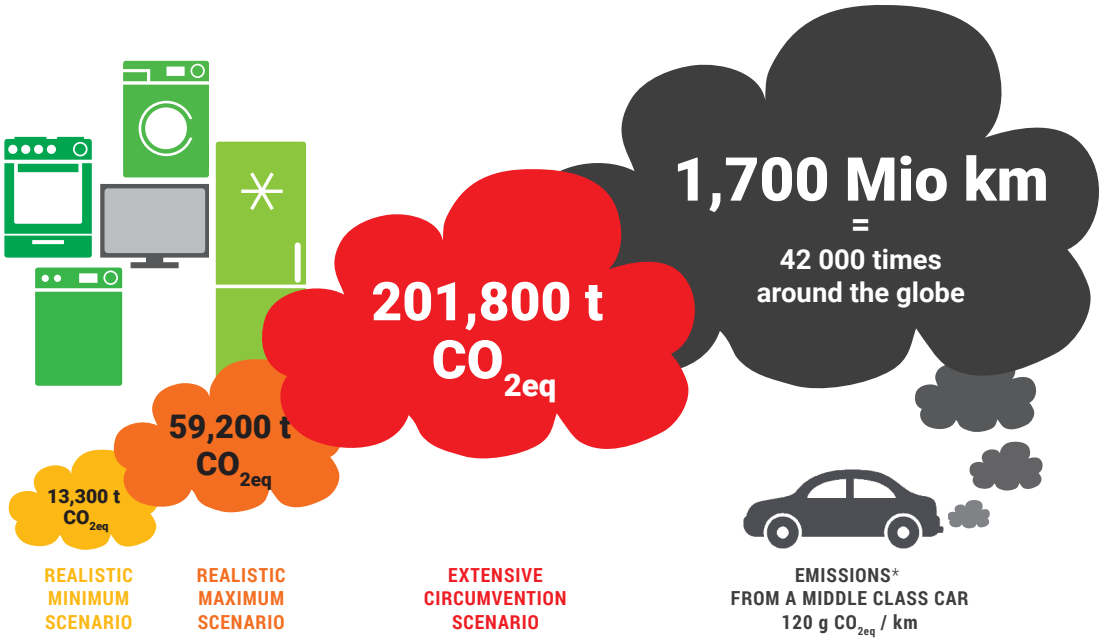
Case	Realistic circumvention scenario		Extensive circumvention scenario	Extensive circumvention scenario over appliances' lifespan	Average operational lifespan of appliances [years]
	minimum	maximum			
Televisions: automatic backlight reduction function	197	691	3,946	39,459	10
Washing machines: specific optimisation at full and half rated capacity	41	328	819	12,289	15
Refrigerating appliances: screen switch-off function	52	325	651	10,411	16
Dishwashers: specific loading instructions	88	178	333	5,001	15
Ovens: volume measurement without shelf guides	17	232	232	4,417	19
TOTAL possible annual losses of potential primary energy savings (TJ/year)	**395**	**1,754**	**5,982**	**71,577**	
Additional emissions CO_{2eq} (t/year)	**13,336**	**59,167**	**201,766**	**2,414,319**	

3 Conversion factor 255 g CO_2e/kWh for the year 2019. Source: EEA, Greenhouse gas emission intensity of electricity generation, last modified 11 June 2021, available at https://www.eea.europa.eu/data-and-maps/daviz/co2-emission-intensity-8

Total possible annual losses of potential primary energy savings (TJ/year) due to circumvention or borderline to circumvention behaviour



Additional emissions of CO_2 equivalents due to circumvention or borderline to circumvention behaviour



* Source: Eurostat (2020): CO_2 Emission Intensity in Europe. https://www.eea.europa.eu/data-and-maps/daviz/co2-emission-intensity-6#tab-googlechartid_googlechartid_googlechartid_googlechartid_chart_11111

However, this reflects only a small proportion of potential losses since a quantification of the impact on the resource consumption was not possible for all the reported and tested cases. In addition, other types of circumvention practices could occur in product categories that were already covered or in product categories that were not yet covered by the ANTICSS project. ANTICSS results also show that not only the electricity consumption, but also the water consumption or the functional performance can be subject to circumvention.

Circumvention of EU ecodesign and energy labelling legislation and standards can have further severe impacts

A non-satisfactory performance under real-life use conditions will probably be noticed by consumers and might lead them to reduce or even avoid the use of the ECO modes, or of other modes/configurations/settings of own appliances. The switch to other, more performing but also probably more resource-intensive programmes/configurations/settings would be disastrous in several respects:

In addition to the possible lost savings and climate protection potential, the trust of the civil society and the business operators in key EU policy instruments such as ecodesign and energy labelling and standards might be irreversibly damaged.

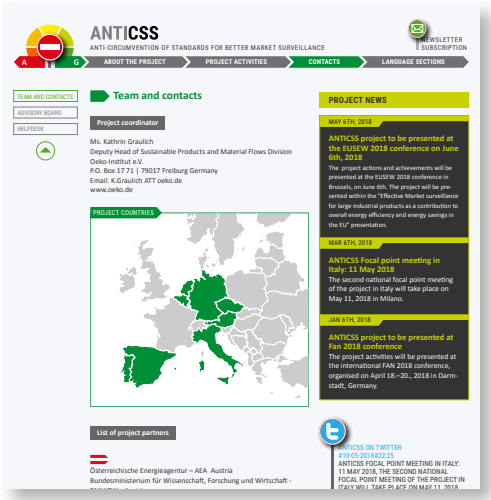
EXAMPLES OF THE SEVERE IMPACTS OF CIRCUMVENTION

- MARKET DISTORTIONS / UNFAIR COMPETITION
- LOSS OF REPUTATION for individual manufacturers and/or entire industries
- LOSS OF CONSUMERS' AND BUSINESSES' TRUST in the overall effectiveness of European legislation and standards

9 / WHAT WE ACHIEVED: ANTICSS CONTRIBUTIONS TO ANTI-CIRCUMVENTION

Main target groups for the complex topic of circumvention are **Market Surveillance Authorities** and **test laboratories** in terms of the verification procedure of product compliance, **policy makers** as well as **standardisation organisations** with regard to the development and revision of EU ecodesign and energy labelling regulations and the respective harmonised standards, **manufacturers** designing products and placing them on the market, consumers represented by **consumer organisations** and in the end the overall environment represented by **environmental NGOs**. From the beginning, the ANTICSS project focused its dissemination and awareness raising activities on these target groups, ensuring early and ongoing stakeholder engagement at European and national level at the various stages of the project.

For example, the ANTICSS Advisory Board consisted of representatives of the industry associations APPLiA Europe (home appliance industry) and EPEE (representing the refrigeration, air-conditioning and heat pump industry), the European consumer organisation BEUC, the standardisation organisation CEN-CENELEC with its Coordination Group on ecodesign, a Member States representative and one person from a Market Surveillance Authority. Further, ANTICSS organised a broad stakeholder consultation, addressing a total of 278 experts at European level (39 Market Surveillance Authorities, 61 industry representatives and 178 consumer organisations, test organisations and environmental NGOs) to contribute their views and experiences to the collection of suspected cases and the development of a concise definition of circumvention. In four dedicated workshops, the perspectives of NGOs, industry representatives, members of standardisation committees and representatives of the European Commission were considered in the formulation of the final ANTICSS recommendations to better address circumvention in future standardisation and policy processes on ecodesign and energy labelling.



The outcomes of the project were regularly presented to Market Surveillance Authorities at the annual meetings of the Administrative Cooperation Groups (AdCo) on ecodesign and energy labelling. Also, the results were presented and discussed at various meetings of national, European and international standardisation committees. For the case of ovens regarding volume measurement without shelf guides, the results of the ANTICSS laboratory tests were reported to the ecodesign and energy labelling review study on cooking appliances and formed the basis for an amendment of the volume measurement in the revision process of the current standard.

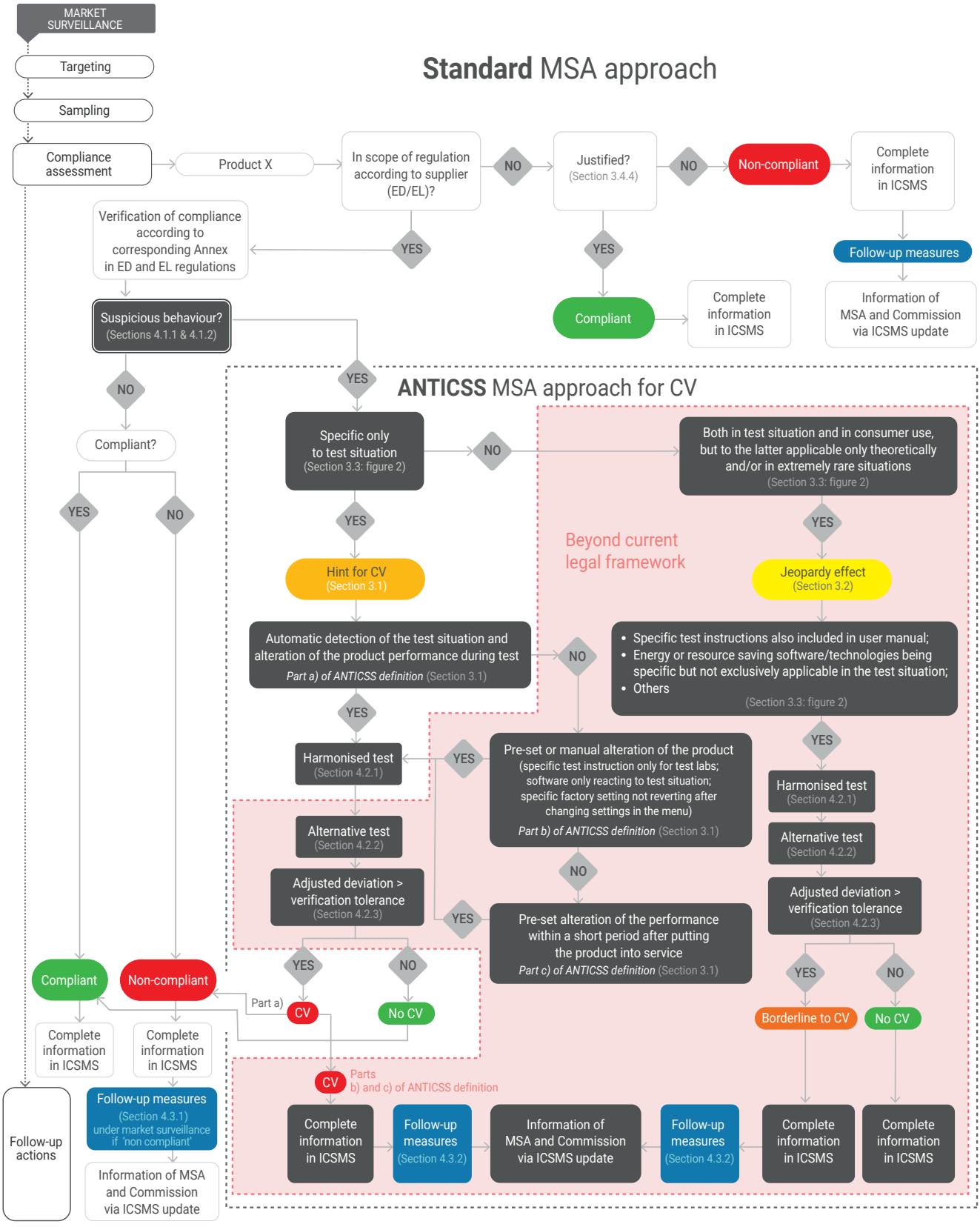
For Market Surveillance Authorities and test laboratories, the ANTICSS project team developed detailed guidelines including process flow charts explaining ways to implement the detection of circumvention in the general compliance verification procedure under ecodesign and energy labelling. As a capacity building measure, these guidelines were presented at two webinars specifically dedicated to MSAs and test laboratories. As another tool facilitating the detection of circumventing products, the test laboratory Re/genT, ANTICSS project partner, developed an Excel based tool to be used by testing laboratories. The tool generates randomly chosen conditions, which must be set during testing and finally provides a statement whether refrigerators under test are suspicious for circumvention or not.

For the scientific community, ANTICSS published two papers and presented them at the Electronic Goes Green conference in 2020 and at the eceee Summer Study on Energy Efficiency in 2021. In 2019, ANTICSS was also presented at the European Sustainable Energy Week (EUSEW).

Finally, to the interested public the ANTICSS research results were communicated through various means and channels. This includes 2 press releases, 5 newsletters, several articles in newspapers, regular information on Twitter and LinkedIn, as well as organising national workshops in each participating partner countries and the final conference. On the web portal www.anti-circumvention.eu all reports, guidelines, tools and presentations as well as the published newsletters and articles are available for download.

All these actions of the ANTICSS project contribute significantly to the general understanding and overall awareness raising of relevant stakeholders to the topic and impacts of circumvention under EU ecodesign and energy labelling and thus deliver a significant progress on the path of anti-circumvention. However, even if a lot has already been achieved not all about circumvention and its implications has been investigated, and not all possible ways to avoid it could be identified within the project. If we are to avoid future losses of energy savings due to circumvention acts, more work is still ahead for all stakeholders involved.

ANTICSS approach of a verification procedure to target circumvention



10 / THE WAY FORWARD: ROLE AND RESPONSIBILITIES OF RELEVANT ACTORS

Interaction and responsibilities of different actors necessary to prevent circumvention

10.1 / INDUSTRY AND PRODUCT MANUFACTURERS

Circumvention is an illegal act. In this respect, the obvious task and legal responsibility of manufacturers is to design products that comply with the applicable EU legislation and (harmonised) standards. However, manufacturers should also contribute to the overall objectives of the EU ecodesign and energy labelling legislation. In simple words:

- more favourable results for a product model achieved through circumvention are non-compliant. The communication of such results to consumers is also leading to non-compliance of provided information.
- providing unreliable indicative information to consumers about the energy and resource consumption and performance of products, where requested by the EU legislation, may also be considered a non-compliance to the more general consumer protection legislation.
- more favourable results due to the exploitation of weaknesses and loopholes in legislation are currently not considered as non-compliance, but are against the spirit and the goals of EU ecodesign and energy labelling legislation and the situation may change in future as result of the ANTICSS project recommendations.
- the misuse/abuse of the possibility to provide, for safety reasons and provision of reliable and reproducible results, manufacturer's instructions for laboratory testing is currently not illegal; however, the exploitation of the resulting more favourable test results is against the spirit and the goals of EU ecodesign and energy labelling legislation and the situation may change in future as result of the ANTICSS project recommendations.

Beyond this, manufacturers can help uncovering acts of circumvention and closing ambiguities or loopholes in legislation and standards. Manufacturers know the products on the market and could therefore recognise and should report at an early stage any apparent irregularity or suspected case that give competitors an unfair advantage.

As members of the ecodesign and energy labelling Consultation Forum as well as of standardisation committees, individual manufacturers or their industry Associations are actively involved in the development and revision of regulations and supporting standards. The identified loopholes or ambiguities should also be reported – and as far as possible overcome – as part of the revision process of legislation or standards.

10.2 / POLICY MAKERS AND STANDARDISATION ORGANISATIONS

Extend the legal definition of circumvention in EU ecodesign and energy labelling regulations to cover all types of circumvention

Circumvention is considered an illegal act according to a new Article included in several recent product specific ecodesign regulations. A generic prohibition is also present in the energy labelling framework regulation (EU) 2017/1369. However, these prohibitions only cover products that actively recognise the test conditions and react by automatically altering their performance during the test. Therefore, it is highly recommended to extend the legal definition of circumvention in ecodesign regulations and the framework energy labelling regulation, to cover – and therefore forbid – also the other situations encompassed in the ANTICSS definition of circumvention: (i) pre-set or manual alteration of the product, affecting performance and/or resource consumption during test and (ii) pre-set alteration of the performance within a short period after putting the product into service.

Specify in harmonised standards the instructions manufacturers may provide only for laboratory testing to avoid misuse

The obligation to follow manufacturer's instruction for the installation of a product or its setting before laboratory testing is per se correct and unavoidable because the manufacturer is the only one legally responsible for the characteristics and compliance of a product with all applicable legislation, including the way it has to be used and tested according to its intended use. The **misuse** of manufacturer's instructions, i.e. prescribing instructions for a specific set-up of the product only for laboratory testing according to the harmonised standard with no comprehensible justification (e.g. technical or safety reasons), in order to achieve more favourable test results falls under the ANTICSS circumvention definition and should be declared illegal in legislation as well as in standards.

Make possible the use of modified measurement methods aimed at indicating the possible presence of circumvention

When products or respective test settings have been manipulated with the aim of circumvention, products appear to comply with the legislation requirements when tested following the measurement methods of the harmonised standards. For this reason, it is impossible to detect circumvention behaviour with the current harmonised standards. The ANTICSS project has developed modified measurement methods that may indicate the possible presence of circumvention. These modified measurement methods may encompass:

- slight variations of the ambient test conditions,
- testing without following the specific manufacturer's instructions or using the accessories provided only for test laboratories;
- testing a certain number of cycles beyond those set in the legislation and in relevant harmonised standards and/or testing in a different (randomised) sequence.

Policy makers and standardisation bodies are also called upon to decide if modified measurement methods should be included in a specific part of the relevant harmonised standard to become legally usable by Market Surveillance Authorities and constitute the legal basis for an eventual enforcement action against circumventing models.

Analyse the application of legislation at regular intervals to identify and overcome jeopardy effects, loopholes and other weaknesses that might facilitate circumvention

The ANTICSS project has highlighted that the existing ecodesign and energy labelling legislation and the respective harmonised standards may include loopholes and other weaknesses – jeopardy effects – that can be legally exploited by manufacturers to achieve more favourable results. The practice has shown that some time is needed after the application of a new regulation or standard to understand the actual implications and relations among the different legal requirements and test conditions. In this respect, the application of legislation and the correspondence of standards to legislation should be analysed at regular intervals to identify ambiguities, loopholes, illogical or unintentional interpretations and other weaknesses that might facilitate circumvention. Once identified, these loopholes could be overcome via a fast track revision procedure of the legislation, via an amendment or the preparation of a new edition of the standard, or specific FAQs included in the Commission Guidelines that usually accompany the EU ecodesign and energy labelling regulations or FAQs prepared by the MSAs within the AdCo Groups for ecodesign and energy labelling.

Identify possible circumvention and jeopardy effects during the compliance verification and laboratory testing of investigated products

Due to the definition of circumvention in the current legal framework the action of Market Surveillance Authorities to detect different possible circumvention behaviours and considering them as non-compliant is currently still limited.

Nevertheless, MSAs and test laboratories are encouraged to actively look for cases suspected of circumvention. These acts may become illegal and the resulting measurements results be considered non-compliant in future legislation. The collection of such cases and exchange of experiences among MSAs and test labs can provide an important basis for this.

Support the development and application of modified measurement methods to identify circumvention

Given the technical impossibility to detect circumvention during laboratory testing following the current harmonised standards, modified test methods should be developed and applied on a case by case basis to identify the possible presence of circumvention.

In case the responsibility of the preparation of modified measurement is put in charge of MSAs, it is advisable that the development of these methods is carried out in close cooperation between MSAs and the technical experts of the commissioned test laboratories. MSAs can provide details on the suspect behaviour as well as being responsible for the follow-up measures in case of resulting non-compliance of the tested product(s). The test laboratories are well-experienced in the measurement conditions for the different technical product parameters and in possible adaptations of harmonised standard test conditions. For example, some test laboratories have already started to develop and use simulation tools which facilitate the slight variation of certain parameters of the test conditions in an automated process.

Regularly exchange experiences about suspicious cases

MSAs and test laboratories could strengthen their competence regarding circumvention: MSAs could systematically collect suspicious cases on circumvention or cases falling under the extended ANTICSS definition of circumvention or jeopardy effects, and share this knowledge with the aim to identify possible patterns, discuss the verification procedure and follow-up measures. For example, the AdCo meetings could serve as regular platform to exchange experiences on how to identify and avoid circumvention.

Bring in your expertise in the legislation and standardisation processes

Whenever possible, MSAs' involvement in ecodesign and energy labelling regulatory processes, including product specific preparatory and revision studies as well as related standardisation work should be encouraged, as the way to include their experience of potential weaknesses and loopholes of regulations and standards that might be used for circumvention.

If the applicable standards do not address known circumvention behaviours or jeopardy effects, test laboratories are recommended to inform the standardisation committee about this situation to promote the relevant modifications during revision.

11 / STILL TO DO: FURTHER NEED FOR RESEARCH

One of the key findings learnt from the ANTICSS project is that the usual verification procedure in the past related to the verification of the declared values compliance via laboratory testing is not fit-for-purpose for the detection of circumvention or jeopardy effects, as the product itself or its settings have been manipulated or loopholes have been exploited so that the test results are influenced in a way that they turn out more favourable precisely under the test conditions of the harmonised standard.

The ANTICSS project developed several modified measurement methods specifically for the purpose of detecting suspect behaviour of models during laboratory testing that may indicate the presence of circumvention. These tests encompass e.g. a slight variation of ambient testing conditions, additional single test parameters or randomisation of test sequences.

MSAs have always the option to develop own non-standardised alternative tests to detect circumvention, but some experts have the opinion that they can be used only for an engagement with the manufacturer and not for a legal enforcement action, not having a legal basis inside an harmonised standard. Other experts instead think that circumvention is not a regulated product characteristic (it is a design act or a prescription of test instructions by the manufacturer), so a harmonised standard is not necessary to conclude on circumvention and therefore MSAs may use all (legal) methods to prove circumvention and in the end the court will decide whether a certain proof is well founded and convincing.

The legal value of modified measurement methods is matter for discussion within the European Commission legal service and experts in EU legislation in order to take a decision about the subject responsible for the preparation. But beyond this, MSAs usually suffer from a lack of personnel and financial resources as well as the deep technical expertise necessary to develop such modified measurement methods on their own.

Therefore, the ANTICSS project recommended that the modified test conditions should become part of the final harmonised standard(s), e.g. in a specific part thereof devoted to prevention of circumvention, with the aim that they will be legally usable by Market Surveillance Authorities, and could constitute a legal basis for an eventual enforcement action against the circumventing models.

It is expected that once the modified test methods are part of the standard the possibility to have a circumventing model will become more and more costly and time consuming for manufacturers, due to the time needed to develop further circumvention behaviours non-detectable also under modified tests. However, also feedback from standardisation organisations has revealed that resources in addition to the regular development and revision of harmonised test standards are rather limited.

For this reason, we summarise the need for further research as follows:

- Further fine tuning of the definition of circumvention:
  - Specification of the types of pre-set or manual alteration of the product that affect performance and/or resource consumption during testing and should be considered as a circumvention.
  - (Legal) relevance of the intention / unintention in the assessment of the design act as circumvention.
- Further development of the ANTICSS classification of cases and models, especially the categorisation and consequences of jeopardy effects with tested models resulting into borderline to circumvention.
- Further development of modified test methods (e.g. randomised test patterns) including the assessment of their reproducibility and repeatability, and the definition of 'circumvention tolerances' in those cases where potential deviations between the harmonised and the modified test procedure could be due to the adaptations of the test methodology itself.
- 'Resilience check' of current standards, i.e. the analysis of which of the test parameters could be randomised or slightly modified without influencing the test results for the regulatory requirements and therefore serve as potential basis for detection of circumvention through the identification of unjustified abnormal reaction of the tested models to these variations.
- Analysis of latest legislation and standards for (new) loopholes and weaknesses that might facilitate circumvention, including the analysis of further product categories not yet in focus of the ANTICSS project for their potential of circumvention.
- Establishing a communication or collaboration platform – engaging all relevant stakeholders such as European Commission, Market Surveillance Authorities, European Standardisation Organisations, test laboratories, industry and NGOs – to exchange experiences and discuss the challenges and conclusions of assessments of products suspect of circumvention.

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NVWA
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ECOS
European Environmental Citizens Organisation for Standardisation

BHTC
Service public federal sante publique, securite de la chaine alimentaire et environnement

AEA
Österreichische Energieagentur

BMDW
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CM
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SEVEn
SEVEn, The Energy Efficiency Center, z.u.

SEIA
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ENEA
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CCIAA Mi
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IMQ
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ADENE
Adene-agencia para a energia

ASAE
Autoridade seguranca alimentar e economica

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