

Come On Labels

Common appliance policy – All for one, One for all – Energy Labels

Contract N°: **IEE/09/628/SI2.558219**

APPLIANCE TESTING

Summary list of tests results carried out on household appliances

(Work Package 3 - Deliverable 3.5)

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NOTE: according to international standards dealing with quantities and units, the numbers in this study are written according to the following rules:

- the comma “,” is the separator between the integer and the decimal part of a number
- numbers with more than three digits are divided by a blank in groups of three digits
- in case of monetary values the numbers are divided by a dot in groups of three digits

This document was prepared within the **Come On Labels project**, supported by the Intelligent Energy Europe programme. The main aim of the project, active in 13 European countries, is to support appliance energy labelling in the field of appliance tests, proper presence of labels in shops, and consumer education.

More information about the project results are published on: www.come-on-labels.eu

1. INTRODUCTION

Energy labels are a crucial driver for market transformation, orienting consumers' choice towards more energy efficient appliances and thus realizing the potential of available technologies.

Unfortunately, not all EU Member States apply effective actions for controlling the correct labelling implementation. Without a concerted effort the same is likely to happen for the forthcoming eco-design and energy labelling implementing measures for energy using products.

The Come On Labels project therefore seeks to collect information about product testing, undertaken in order to verify energy consumption related information on the product energy labels. This information is shared by the project partners in 13 European countries with stakeholders, such as national surveillance authorities, manufacturer and retailer representatives, consumer organisations, media, etc.

The main goal of this document (project Deliverable n.3.5) is to increase European-wide implementation and control of energy labelling and eco-design implementing measures for appliances by:

- giving concrete guidance to EU and National Authorities for an increasingly effective labelling implementation;
- setting a largely shared procedure for the verification of the manufacturers' labelling declaration including a methodology for laboratories accreditation and models selection;
- circulating results of the European testing results on household appliances;
- contributing to increasing the attention of the National Authorities through a better awareness of the impact of the energy labelling on the national energy efficiency.

This project document, focused on the summary of available information about product testing, is being published three times during the Come On Labels project duration (12/2010 – 5/2013), and this is its third and final edition.

- The first issue was published on June 2011 and was concentrating on the testing results for refrigerating appliances of the ATLETE project, the largest European project on testing products towards the energy label compliance run in the year 2009-2011;
- The second issued, published in April, described the overall outcome of the market surveillance action performed in UK in 2010-2011 and in Australia in 2011 and summarised the content of two IEE co-funded projects on market surveillance and compliance verification: ATLETE II and ECOPLIANT projects, which started in 2012.

Both of these documents are available at:

<http://www.come-on-labels.eu/appliance-testing/appliance-tests-2011-2013>

This document concentrates on:

- publicly available results from the United Kingdom's NMO tests in 2011-2012
- a collection of miscellaneous information about market surveillance actions developed in other EU Member States by different organisations, such as the market surveillance authorities, or retailers associations when less complete or older information are available
- the outcome of the Australian 2011-2012 market surveillance action
- the outcome of the USA 2011 market surveillance action

A concluding chapter will summarize the main findings and difficulties encountered in the collection of the data and information presented in the three issues of this document (Come On Labels project's Deliverable 3.5¹.), which summarised the publicly available information about product surveillance and labelling compliance testing.

¹ <http://www.come-on-labels.eu/appliance-testing/appliance-tests-2011-2013>

2. Verification tests on household appliances

2.1 Surveillance testing activities within the European Union

2.1.1 Case studies from the UK, 2011-2012

The National Measurement Office (NMO)² is an Executive Agency of the Department for Business, Innovation and Skills (BIS) and is the Market Surveillance Authority for EU Energy Labelling and Ecodesign legislation in the United Kingdom.

The Memorandum of Understanding (MoU) between DEFRA³ and NMO was signed on 12th November 2009, which appoints the NMO as the Market Surveillance Authority for this legislation. DEFRA holds the Policy lead.

The examples below show that an effective market surveillance action, based on:

- (i) the full respect of the verification procedure established by the EU labelling and ecodesign legislation and
- (ii) a continuous dialog with the involved supplier

results not only in environmental and consumer protection due to the withdrawal from the market of non-compliant appliances along with some kind of monetary compensation for the consumers (who bought the mis-labelled appliances) but also in the support to the manufacturer for the identification and elimination of manufacturing process faults.

a) Washing machine Candy 1400 rpm spin speed

The NMO has reported in August 2011 to have completed an investigation into the energy efficiency of a Candy 1400 spin speed washing machine. Initial results indicated that the machine used 7% more energy than the company claimed and that the spin drying performance was only class B when claimed to be class A, possibly explained by a measured spin speed of only 1300 rpm.

Because the EU legislation includes a 10% tolerance when suppliers declare the energy efficiency of their products, the suspect of for not being compliant for the energy efficiency of the initial tested unit resulted unsubstantiated.

NMO focused then on the spin drying performance of the machine and made contact with the company. After a lengthy investigation it has been discovered that the washing drum was not perfectly balanced due to its dimensions not meeting the technical production specification. This can cause the drum to touch the rubber door gasket reducing the maximum speed of the drum and reducing the performance of the washing machine.

² <http://www.bis.gov.uk/nmo>

³ <http://www.defra.gov.uk/>

In cooperation with NMO, Candy immediately suspended production of the washing machine model concerned, instigated a rework programme for all stock items and has reviewed the design dimensions to ensure a more stable spin performance.

b) Dishwasher Smeg DF6FABRO

In October 2011 NMO published the outcome of an investigation into the mislabelling of a dishwasher, which was part of a wider project examining the level of compliance within this area of the market. The Smeg DF6FABRO dishwasher was declared class A for energy efficiency, class A for washing performance and class A for drying performance.

Test results showed the product to be rated BBC for the respective claims, with energy efficiency being more than 15% worse than the claim and cleaning and drying performances 9% and 17% below the declaration respectively. On receipt of the results, the NMO engaged with Smeg UK to determine the cause of these failures and a meeting was arranged to discuss causes and corrective actions. Within two days of this first contact Smeg stopped production of the DF6FABRO and placed the remaining stocks of the dishwasher in quarantine. By the date of the meeting they had been sent back to the factory.

The manufacturer of these products have implemented a new platform for dishwasher production, that included a complete overhaul of components resulting in significant improvements to the performance of their models to ensure the compliance of dishwashers currently being sold on the UK and EU markets. Smeg also reduced their use of tolerances to achieve the desired energy declarations, giving consumers a better indication of the performance of the product they are purchasing.

The NMO declared it will continue to work with the company and the rest of the industry on this issue to withdraw the reliance on tolerances, ensuring consumer protection as well as a fair marketplace.

To demonstrate their commitment to sustainability the company made a financial donation to an environmental charity. This was designed to mitigate some of the environmental and consumer detriment caused by the dishwashers.

c) Washer dryer Hotpoint AQM8F49D-80

In July 2012 NMO completed an investigation into the inaccuracy of declarations provided by a manufacturer on the energy labels they supplied with their washer driers. Hotpoint, an Indesit Company owned brand, was issued with a simple legal caution after admitting to the offence and agreeing to a package of measures to resolve the problem.

The initial test on one unit of the appliance resulted in the machine using 24% more energy than claimed on the energy label (5,44 kWh/cycle declared but 6,75 kWh/cycle used) with the difference meaning the drier function of the machine was a class C when it was instead declared as class A. In accordance with the verification procedure defined by the EU legislation and the relevant harmonised standard, three further AQM8F49D-

80 washer driers were purchased and tested. The test showed the three units to use an average of 25,3% more energy than the declaration confirming the findings of the initial test and the non-compliance of the washer-dryer.

The NMO subsequently engaged with Hotpoint to investigate the reasons for these results. It was established that the discrepancy was due to a file setting error which caused the appliance to spin dry laundry for longer than necessary, consuming more energy in the process.

There were 5.000 products affected which have been placed on the UK market between July 2010 and September 2011, when the NMO became involved. To resolve the problems and offset some of the consumer detriment caused by the error Indesit agreed to offer consumers who are traceable by the registration of their warranty the opportunity for a technician to fix the file setting error free of charge. The consumers affected will also be given a voucher for washing detergent to the value of £30 to counteract the extra energy costs incurred as a result of the problem.

Indesit is also reviewing its quality management systems and working with the NMO and to ensure there is no repeat of the problem. The 279 units of the washer drier that were held in quarantine are to be upgraded by the company, before being released back onto the market with an accurate energy label.

d) Chest freezer Zanussi ZFC321WA

Zanussi, part of the Electrolux Group, were contacted in April 2012 when the 200 litre chest freezer ZFC321WA was found to use an average of 14,4% more energy than declared on the label: the measured figure from the accredited testing process was 272 kWh/year against the supplier declaration of 238 kWh/year.

After being made aware of the NMO's findings Electrolux implemented an internal investigation to analyse and address the issue. The NMO were kept informed of the company's actions before they presented the NMO's full findings in a meeting in July, showing that the discrepancy had been traced to an excessive vibration in one of the production lines which caused the evaporator tube to become knocked away from the inner liner, causing the chest freezer to use more energy to reach the required temperature. This line was responsible for the manufacture of 79% of the affected model.

The problem was traced to chest freezers manufactured over a 15 month period. Electrolux devised a way to fix the problem relating to future production and quarantined a stock of 209 units which will not be placed on the market.

To demonstrate their commitment to sustainability and address the environmental detriment caused by the energy consumption over and above that declared on the label of the chest freezer, Electrolux have made a donation of over £15,000 to the Woodland Trust. This was part of an compliance enforcement undertaking composed by the manufacturer, offsetting detriment and explaining the full list of measures they have taken as part of their internal solutions to resolve the problem.

2.1.2 EU: Miscellaneous case studies from Member States

2.1.2.1 The Nordic country project

Financed by The Nordic Council of Minister starting from 2011, the aim of the project is to develop the Nordic collaboration concerning market surveillance to check the accuracy of the information declared on the energy label and if the product fulfils the eco design requirements for Sweden, Norway, Denmark, Finland and Iceland.

In March 2011, a decision was taken to test refrigerators compliance to ecodesign (Regulation 643/2009) and energy labelling (delegated Regulation 1060/2010). The DTI (Teknologisk Institute in Denmark) was selected for testing refrigerators.

Two refrigerating appliances, Menuett 802-366 and Vestfrost SW 365 R FI where found exceeding the declared energy consumption by 12% and 14,4% respectively.

Although no additional information is available on the technical characteristics of the two appliances and if the 2 Steps verification procedure encompassed by the EU legislation has been followed, this is a good example on how test developed in one laboratory could be used as the basis for a market surveillance action in a number of EU countries.

2.1.2.2 The Netherlands: use of test results obtained from foreign laboratory

Another example of the successful use of test results achieved in a laboratory of a different Country is included in the “Annual report 2009, Energy label compliance in the Netherlands” of the Dutch market surveillance authority.

As shown in Table 1, most of the tests on household appliance were done in the German laboratory VDE located in Offenbach. The testing of appliances followed a European procurement procedure, after which VDE Offenbach and TNO Apeldoorn were selected to carry out tests for 2009. On the basis of random sampling, several appliances from each category were tested to establish the level of correctness of information provided on energy labels.

Table 1: Products tested for compliance to the energy labelling in 2009 in NL

Product	Number of models	Number of tests	Laboratory
Refrigerators and freezers	11	17	TNO Apeldoorn
Washing machines	6	6	VDE Offenbach
Dishwashers	3	3	VDE Offenbach
Dryers	1	1	VDE Offenbach
Electric ovens	8	8	VDE Offenbach
Air conditioners	12	16	TNO Apeldoorn
CFL	17	85	VDE Offenbach

The EU verification procedure was applied: 1 unit of the model is tested at first. If the result differs more than 15% from the value declared by the supplier, 3 additional units of the same model are tested. This applies to all products except air conditioners (where only 1 unit of the same model is retested in the second Step) and CFLs, where 5 lamps were tested each time. Only the compliance of the energy consumption was apparently tested and not all other parameters listed on the relevant energy labelling implementing directives.

The overall results (Table 2) show that:

- refrigerators and freezers: 3 models were declared non compliant for the energy consumption, but only for two the results of the test on the 1+3 units are reported (Table 3)
- CFLs: 5 lamps from 8 different manufacturers were tested. One lamp had an incorrect label
- air conditioners: one model was non-compliant after the two Step procedure, while for other 2 models the importer took measures after the first test
- for other products all models were found compliant.

Table 2: Results of product test in 2009 in NL

Product	Number of models	Compliant models	Non-compliant models
Refrigerators and freezers	11	8	3
Washing machines	6	6	--
Dishwashers	3	3	--
Dryers	1	1	--
Electric ovens	8	8	--
Air conditioners	12	9	3
CFL	17	16	1

Table 3: Test results for refrigerators and freezers in 2009 in NL

Category	Energy efficiency class	Compliance (Y/N)	Energy consumption		Differ. (%)
			declared (kWh/year)	measured (kWh/year)	
Refrigerator-freezer	A++	No	212	248,3	17%
			212	245	16%
			212	263	24%
			212	248	17%
Refrigerator	A+	No	143	183,2	28%
			143	157	10%
			143	174	22%
			143	200	40%
Refrigerator-freezer	A++	Yes	204	207,7	2%
Refrigerator-freezer	A+	Yes	219	215	-2%
Freezer	A++	Yes	242	237	-2%
Refrigerator-freezer	A	No	146	n.a.	n.a

Refrigerator-freezer	A+	Yes	299	n.a.	n.a
Refrigerator-freezer	A+	Yes	325	344	6%
Refrigerator-freezer	A+	Yes	302	332,8	10%
Freezer	A++	Yes	264	178,1	-33%
Refrigerator	A	Yes	161	160,2	0%

2.1.2.3 UK: Test results by the Energy Saving Trust

The UK's Energy Saving Trust Recommended (ESTR)⁴ voluntary product labelling scheme is an example of an Environmental Product Information Scheme (EPIS) encompassing its own compliance testing, enforcement activity and evaluation for environmental effectiveness and improvements in environmental quality.

The ESTR Scheme was established at the request of the UK Department for the Environment and launched in July 2000. It is a voluntary product labelling scheme for domestic energy saving products and is classified as an ISO Type I-like environmental labelling scheme. [11]

Between 2010 and 2012, EST tested 24 refrigerating appliances for the energy consumption and the storage volume parameters, to verify if specific models submitted to the scheme met the criteria, as declared by the manufacturers.

Despite EST not being a market surveillance authority, EST claims that the testing activities were conducted fully to the requirements of the respective technical norms EN 153 and EN/ISO 15502 and to the appropriate parts of the Commission Delegated Regulation 1060/2010 – concerning energy consumption and volume parameters. The other technical parameters to be mandatorily tested (storage temperatures) and those declared in the mentioned EU energy labelling scheme (temperature rise time and freezing capacity for refrigerator-freezers and freezers) were not tested.

The results of tests have been shared with DEFRA and the UK's Market Surveillance Authority the National Measurement Office. In particular the following subcategories of products have been selected for testing (individual models are chosen using a random stratified sampling methodology):

- refrigerators: 2 models
- refrigerator-freezers: 14 models
- freezers: 8 models

The reported overall compliance results were:

Parameters	Pass %	Fail %
Energy consumption	75	25
Storage volume	75	25

⁴ <http://www.energysavingtrust.org.uk/>

When any non-compliances are returned from Step 1 testing, the Energy Saving Trust's practice is a presumption in favour of non-compliance, based on the considerable global evidence base on over-declarations, and given the non-regulatory basis of the Scheme, is actually a benefit - seeking to optimise the process. While generally only Step 1 is delivered during the testing activity, all suppliers concerned have received the information about the test results and been given the opportunity to challenge the results. The EST scheme guarantees indeed that where there are disagreements and challenges over the findings of the testing, Step 2 is initiated, with three more units being tested. All examples of testing non-compliances were resolved, often without challenge by the supplier.

As far as the energy consumption is concerned, it is worth noting that 4 models out of the 6 for which a Step 2 test (on 3 additional units of the same model) would have been necessary in case of a supplier disagreement with the test results, show a difference between the declared and the measured value largely exceeding the permitted tolerance of the relevant labelling scheme (15% for the old label and 10% for the new label), while for the other 2 models the difference is small (15,50% against 15% and 10,60% against 10%). Figure 1 shows the difference (%) between the measured and the declared value for each tested model. In any case, for all models with differences between the declared and the measured electricity consumption measured larger than 15% (according to the then valid legislation), the model was considered as non-compliant.

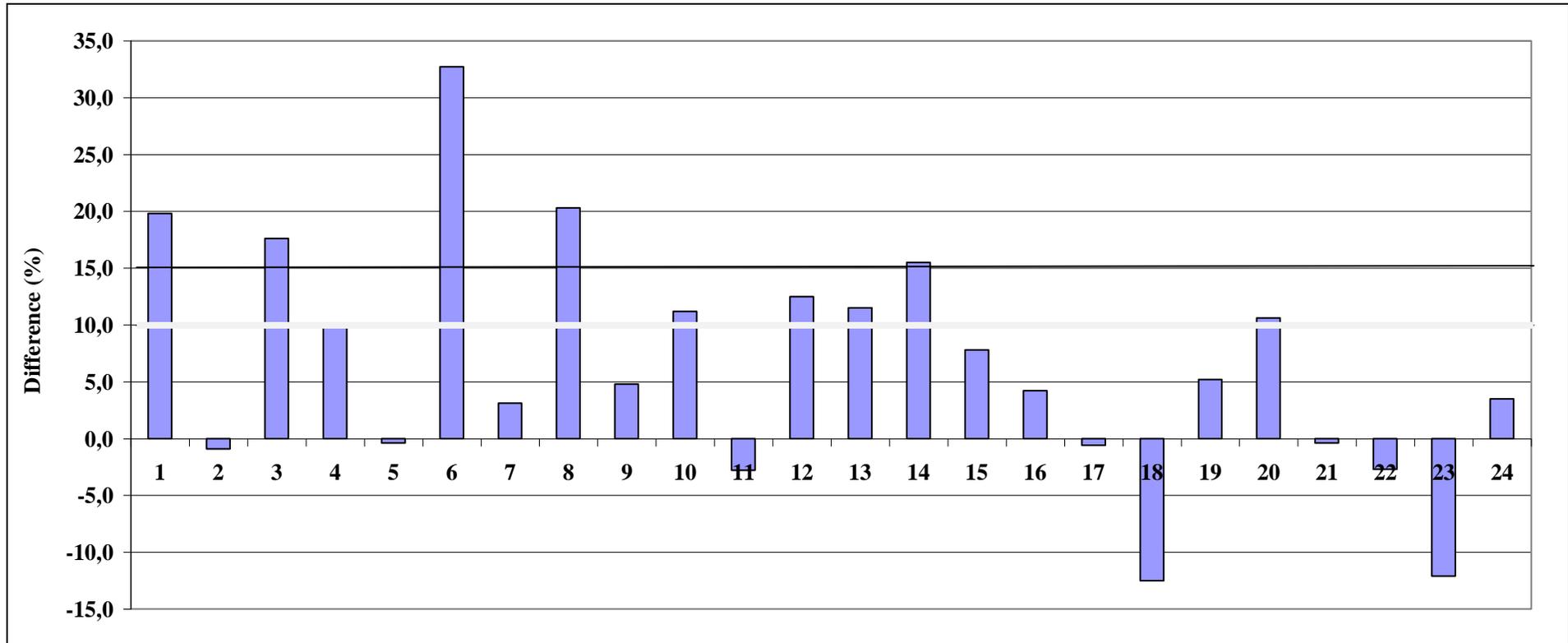
Based on the results of the tests, EST has withdrawn the respective models from its EST Recommended scheme. Some 5% of all models listed within the EST Recommended scheme are tested, and while individual model names are not published, summary results, such as the number of products tested, number of compliant products, number and decisions about the scheme-non compliant products.

Table 4: Re-elaboration of the 2010-2012 EST test results on refrigerating appliances

Year tested	Model identification	Appliance type	EU Energy Label		Energy Consumption (kWh/year)			Passed ESTR Criteria? (A+ minimum)	Fresh Food Storage Volume				Frozen Food storage volume				Overall results
			New or old label	Energy efficiency class	Declared	Measured	Difference (%)*		Declared	Measured	Difference (%)	Pass/Fail	Declared	Measured	Difference (%)	Pass/Fail	
2010/11	1	Freezer	old	A+	171	205	19,8	Step 2 needed	n/a				85	86	1,2	Pass	Step 2 needed
2010/11	2	Refrigerator freezer	old	A+	263	261	-0,9	Pass	184	187	1,6	Pass	92	94	2,2	Pass	Pass
2010/11	3	Refrigerator	old	A+	131	154	17,6	Step 2 needed	228	229	0,4	Pass	n/a				Step 2 needed
2010/11	4	Freezer	old	A+	288	317	9,9	Pass	n/a				365	359	-1,6	Pass	Pass
2010/11	5	Refrigerator freezer	old	A+	438	436	-0,4	Pass	343	290	-10,8	Fail	175	168	-1,7	Pass	Fail
2010/11	6	Refrigerator freezer	old	A+	306	406	32,70	Step 2 needed	231	233	0,9	Pass	106	98	-7,5	Fail	Fail
2010/11	7	Refrigerator freezer	old	A+	215	222	3,10	Pass	222	228	2,7	Pass	26	26	0,0	Pass	Pass
2010/11	8	Refrigerator freezer	old	A+	434	522	20,30	Step 2 needed	335	289	-7,8	Fail	180	176	-1,7	Pass	Fail
2010/11	9	Freezer	old	A+	262	275	4,80	Pass	n/a				188	198	5,3	Pass	Pass
2010/11	10	Refrigerator freezer	old	A+	226	251	11,20	Pass	234	227	-3,0	Pass	21	21	0,0	Pass	Pass
2010/11	11	Refrigerator freezer	old	A+	441	428	-2,80	Pass	345	325	-5,8	Fail	179	179	0,0	Pass	Fail
2010/11	12	Freezer	old	A+	157	177	12,50	Pass	n/a				82	75	-8,5	Fail	Fail
2010/11	13	Refrigerator freezer	old	A+	296	330	11,50	Pass	210,0	206,0	-1,9	Pass	70	75	7,1	Pass	Pass
2010/11	14	Freezer	old	A+	186	215	15,50	Step 2 needed	n/a				80	86	7,5	Pass	Step 2 needed
2010/11	15	Freezer	old	A+	267	288	7,80	Pass	n/a				193	199	3,1	Pass	Pass
2011/12	16	Refrigerator	new	A+	130	135	4,20	Pass	152	151	-0,7	Pass	n/a				Pass
2011/12	17	Freezer	old	A+	223	222	-0,60	Pass	n/a				170	165	-0,6	Pass	Pass
2011/12	18	Refrigerator freezer	new	A+	458	401	-12,50	Pass	335	293	-5,1	Fail	180	127	-14,4	Fail	Fail
2011/12	19	Refrigerator freezer	new	A+	275	289	5,20	Pass	155	154	5,2	Pass	62	63	1,6	Pass	Pass
2011/12	20	Refrigerator freezer	new	A+	290	321	10,60	Step 2 needed	222	219	-1,4	Pass	59	66	11,9	Pass	Step 2 needed
2011/12	21	Refrigerator freezer	new	A+	276	275	-0,40	Pass	182	181	-0,5	Pass	110	119	8,2	Pass	Pass
2011/12	23	Freezer	new	A+	213	207	-2,70	Pass	n/a				104	102	-1,9	Pass	Pass
2011/12	24	Refrigerator freezer	new	A+	172	151	-12,10	Pass	97	98	1,0	Pass	16	16	0,0	Pass	Pass
2011/12	25	Refrigerator freezer	new	A+	292	302	3,50	Pass	201	199	-1,0	Pass	72	71	-1,4	Pass	Pass

*measurement tolerance for energy consumption: 15% old label and 10% new label

Figure 1: Difference (in %) between the measured and the declared value for the energy consumption for the UK's EST tests on refrigerating appliances



2.1.2.4 Spain: Testing carried out by different institutions and manufacturers

The Spanish Association of Domestic Appliances Manufacturers, ANFEL, is active in supporting market surveillance by denouncing non-compliant household appliances and relevant suppliers.

The National Energy Agency IDAE⁵ (administering a national replacement scheme “Renove Plan”) and the Regional Authorities also carried out tests for checking the compliance of domestic appliances.

Examples of the actions made by ANFEL are:

- in June 2010⁶ the No frost refrigerator-freezer DAEWOO ERF-387 MHB has been tested in the Spanish laboratory LCOE (Laboratorio Central Oficial de Electrotecnia). The declared energy consumption was 364 kWh/year, against a measured energy consumption of 547 kWh/year (more than 50% higher). No additional information about the number of unit that were tested for the mode is available. However ANFEL has requested an action to the government authorities and IDAE,
- in May 2011⁷ ANFEL has denounced that the refrigerator-freezer SAMSUNG RL40 HGSW has a measured energy consumption of 351,5 kWh/year against a declared value of 285 kWh/year (or 23% higher). The Association has asked IDAE to delete the model from the “Plan Renove de Electrodomésticos” (Renove Plan of Domestic Appliances) the national public initiative that promotes the replacement of old appliances by new efficient ones.

⁵ <http://www.idae.es/>

⁶ <http://www.anfel.org/noticias2.cfm?idSeccion=1&id=242>

⁷ <http://www.alimarket.es/noticia/64167/Anfel-denuncia-a-Samsung-por-incumplimiento-de-etiquetado>

2.2 Australia 2011-2012 test results and updates

In the second half of 2011, 74 Stage 1 check tests were completed, and the results finalised for additional 3 products that failed Stage 1 testing before 1 July 2011. Of these 77 products, 63 (or 82%) passed Stage 1 and one further product passed Stage 2 and is therefore considered to be compliant with performance requirements. Among the remaining 13 products that failed Stage 1 (see Table 5):

- the registrations of 4 models were cancelled either at the request of the supplier, or because the supplier did not respond to the regulators notice in sufficient time
- 1 product was not registered at the time it was selected for check testing and as a result of the check test failure, was refused permission to register
- 5 products are either proceeding to Stage 2 testing or a decision is pending by the regulator
- 3 products proceeded to Stage 2 testing and the results were not yet available.

Table 5: Summary of Stage 1 check testing results in July-December 2011 in Australia

July-Dec 2011					
Total	77	Results of Stage 1 test failures			
Pass	64	Awaiting further information	Registration refused	Registration cancellation	Proceeding to stage 2 testing
Fail	13	5	1	4	3

The 77 models tested (including Stage 2 tests) represented 44 individual brands, as shown in Table 6.

Table 6: Brands of tested models in July-December 2011 in Australia

Brands	Number Tested	Brands	Number Tested	Brands	Number Tested
ABB	1	FISHER & PAYKEL	1	RINNAI	2
AKAI	0	GRUNDIG, BUSH	1	SAMSUNG ELECTRONICS	6
AQUAMAX	3	HELLER	1	SANDEN INTERNATIONAL	1
ARISTON	1	HISENSE	2	SHARP	1
ASKO	1	INVERTEK	1	SMEG	1
AWA	1	LG	6	SONIQ	2
BROOK CROMPTON	1	LOEWE	1	SONY	3
CELESTIAL	1	MEIZ	1	SUNVIEW	1
CHANGHONG	4	NEONIQ	1	TEAC	3
CMG	1	OMEGA	1	TECOVISION	2
CONIA	1	PALSONIC	2	TOSHIBA	3
DICK SMITH	1	PANASONIC	4	VIVO	2
DUX	1	PANGOO	1	VOXSON	1
E.E. GREEN	1	PASTORKALT	1	VULCAN	2
F.E.D.	1	RHEEM	4		

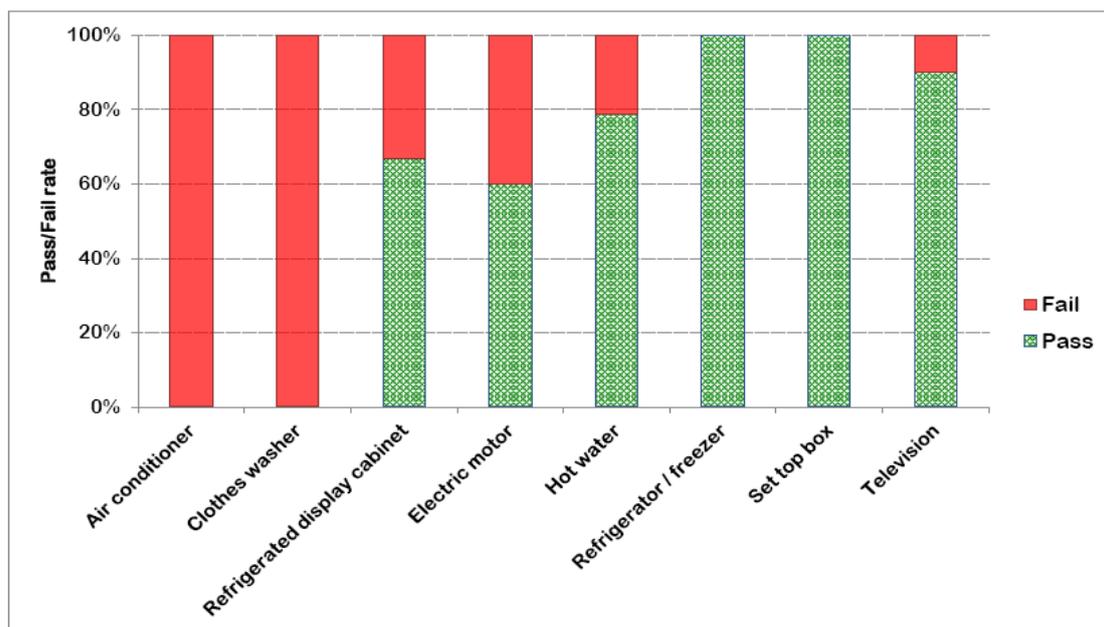
Televisions and water heaters were the most tested products during the period, accounting for 83% of the total. The distribution of tests by product and the respective

results of Stage 1 testing are shown in Figure 2 and Table 7. In total 64 (or 83%) products comply with the energy regulations and 10% of tests have still to be resolved. This includes 5 products that are awaiting a supplier response to failed Stage 1 and three Stage 2 that are being finalised.

Table 7: Stage 1 testing results by product in July-December 2011, in Australia

	Air conditioner	Clothes washer	Refrigerated display cabinet	Electric motor	Hot water	Refrigerator / freezer	Set top box	Television	TOTAL
Total	1	1	3	5	14	1	2	50	77
Pass			2	3	11	1	2	45	64
Fail	1	1	1	2	3			5	13

Figure 2: Stage 1 test results by product in July-December 2011 in Australia



One product has had its registration cancelled in the first quarter of 2012 as shown in Table 8.

Table 8: Product registration cancellations in the first quarter of 2012 in Australia

Product Type	Brand	Model	Cancellation date	
Television	Changhong	E32M250FD-NE	05.01.12	The supplier of this model voluntarily cancelled the registration after check testing found it had been shipped in a higher energy using mode to that declared for labelling and registration purposes.

Despite the very different mix of products tested in the first and second halves of 2011 in Australia, the overall compliance rates were similar. Given that testing is targeted towards products identified as most likely to fail, these figures do not reflect general compliance rates. Nonetheless, 2011 showed an increase in compliance levels for some categories which may suggest an underlying improvement in the general quality of these products.

During 2012, the Greenhouse and Energy Minimum Standards Bill (GEMS) 2012 was introduced to Parliament (30 May 2012). The GEMS legislation will create a nationally-consistent framework for the E3 Program⁸ by removing inconsistencies across the state and territory laws and by establishing single national regulator to administer equipment energy efficiency. The GEMS legislation was scheduled to commence on 1 October 2012. The introduction of a unique Australian national legislation also creates an opportunity to make a number of improvements to the way the E3 Program is delivered: one change includes new procedures for dispute resolution and review of formal decisions.

⁸ Equipment Energy Efficiency Program (E3): <http://www.energyrating.gov.au/programs/e3-program/>

2.3 USA: DoE test results for Energy Star

In 2010, the US Department of Energy launched a pilot program to verify the energy efficiency and water-use characteristics of selected Energy Star⁹ products through laboratory testing. The pilot verification program helped ensure that Energy Star products deliver the efficient use of energy and water that consumers expect, while minimizing costs and inconvenience to product manufacturers.

a) Background

The process used to determine if a model met an Energy Star specification was based on DoE's enforcement sampling plan, with several modifications made to minimize test cost while providing sufficient data to make a final decision.

In Stage 1, DoE conducted a "spot-check" of a single unit of a specified model. No further testing action is taken if the unit performed no more than 5% worse than the Energy Star specification. If the product tested is more than 5% worse than the Energy Star specification, DoE initiated Stage 2 testing. In addition, if a unit tested worse than the applicable DoE energy or water conservation standard, the basic model was referred to the DoE Office of General Counsel for possible enforcement action.

In Stage 2, DoE tested additional units of the original basic model in accordance with the Code of Federal Regulations' sampling plan. Testing was limited to additional seven units. If, following Stage 2 testing, a model was determined to not meet the Energy Star specification, the model was referred to EPA for further action.

b) Pilot Programme results

The Pilot Program testing was conducted at five independent third-party test laboratories using the relevant DoE test procedures as described in 10 CFR Part 430 Subpart B. The Results are shown in Table 9.

- **Stage 1:** of the 239 tested units, freezers showed the worst Stage 1 compliance, with 5 (28%) of the models performing more than 5% worse than the Energy Star specification, followed by room air conditioners and residential dishwashers with 20 (26%) and 2 (20%) of the models, respectively; all 19 tank-less and storage water heaters tested passed the Stage 1 and therefore did not require Stage 2 analysis.
- **Stage 2:** of all products tested, 44 models (18%) required additional Stage 2 testing. Of these, 12 models (5%) were found to meet Energy Star specifications after Stage 2 testing. However, 24 models (10%) were ultimately referred to EPA.

⁹ <http://www.energystar.gov/>

Table 9: Results of the Energy Star Pilot Programme testing in USA

Product Type	Total Units Tested in Stage 1	Required Further Action (Percent of Product Type)			
		Total	Met ESTAR Specification in Stage 2	Referred to EPA ^a	Other ^b
Refrigerators and Refrigerator-Freezers	76	11 (14%)	3 (4%)	4 (5%)	4 (5%)
Freezers	18	5 (28%)	1 (6%)	4 (22%)	0 (0%)
Residential Clothes Washers	39	6 (15%)	3 (8%)	2 (5%)	1 (3%)
Residential Dishwashers	10	2 (20%)	1 (10%)	1 (10%)	0 (0%)
Tankless Water Heaters	11	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Storage Water Heaters	8	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Room Air Conditioners	77	20 (26%)	4 (5%)	13 (17%)	3 (4%)
Total	239	44 (18%)	12 (5%)	24 (10%)	8 (3%)

a. Includes models referred directly to EPA without further testing.

b. DOE conducted no further testing on these units because they were either no longer available in the market or they were referred directly to EPA for potential enforcement action.

Pilot Program results indicate that 44 models (18%) tested in Stage 1 required additional testing (Stage 2). Additionally, of those 43 models, eight models (20%) required a second Stage 2 sample (e.g., selection of a total of 5 to 8 units)¹⁰. In only one case a model was found to not meet Energy Star specifications after a second Stage 2 sample. This suggests that the second Stage 2 sample is of little value to the Department, making it an unnecessary burden. As a result, the Department has eliminated the second Stage 2 sample, and will determine compliance following the testing of three additional units.

The fact that two-thirds of the models tested in Stage 2 did not meet Energy Star specifications implies that the screening process used in Stage 1 is appropriate and that the sampling and statistics in Stage 2 can differentiate between models that do and do not meet the Energy Star specification. Consistent with Stage 1 results, room air conditioners and freezers also had the worst Stage 2 performance relative to the Energy Star specifications, with 13 room air conditioners (17%) and four freezers (22%) referred to EPA.

The pilot program was initiated prior to the EPA’s Certification Body requirement enforcement.

¹⁰ Stage 2 testing had the potential for two separate samples. A second sample was necessary only if the model calculations were indeterminate after the first sample, and was calculated based on the standard deviation of the first sample.

3. IEE PROJECTS FOR MARKET SURVEILLANCE OF HOUSEHOLD APPLIANCES

The Intelligent Energy Europe programme¹¹, operated by EACI, is an EU subsidy programme, supporting projects related to energy efficiency.

One of the funding priority areas of the programme is the promotion of energy efficient products, as well as market verification activities, supporting the proper display and declarations on the energy label. (Come On Labels project is one of such projects, funded by the same programme).

The following Table 10 provides an overview of the recent and current IEE projects in this area.

Table 10: Recent and current IEE projects on market surveillance and products energy efficiency

Project name	Duration	Website	Tested products	Notes
ATLETE	6/2009–7/2011	www.atlete.eu	Refrigerating appliances (82 models)	Full results, including model names and test reports available here : http://www.atlete.eu/index.php?option=com_content&view=article&id=125&Itemid=117
ATLETE II	5/2012–10/2014	www.atlete.eu	Washing machines (50 models planned)	Test results expected in 2014.
Euro Topten MAX	1/2012–12/2014	www.topten.eu	TV, LED lamps, tumble drier.	Test results expected in 2014.
PremiumLight	5/2012–10/2014	http://www.eaci-projects.eu/iee/page/Page.jsp?op=project_detail&prid=2499	High quality CFL and LEDs (60-80 models)	Test results expected in 2013 and 2014
Ecopliant	4/2012–4/2015	www.ecopliant.eu	To be decided by participating countries	Test results (general, not for individual models) expected in 2014
MarketWatch	spring 2013 – spring 2016	n.a.	To be decided based on a higher risk of non-compliance	Expected in 2014
CompliantTV	spring 2013 – end 2015	n.a.	TVs (125 models) and monitors (75 models)	Expected in 2014

¹¹ <http://ec.europa.eu/energy/intelligent/>

It is worth noting that for the specific nature of the IEE programme, the results of the projects have to be made public. However, some projects publish all the results, including individual model names of products tested and test reports, some other only publish aggregated results for the whole product group.

Selection criteria of individual models also differs within the project – from random selection from the market, to targeted selection based on non-compliance suspicion, market share, product price and a combination of such criteria.

Typical project partners of these projects are energy agencies, consultancies and experts in energy efficiency, NGOs, and surveillance authorities.

Checking these projects is an important step in finding out more on the level of testing surveillance activities, current experience and best practice around the EU.

4. CONCLUSIONS

Beyond the specific measured values reported in the three issues of D3.5, some general conclusions can be drawn from the overall exercise:

- ***Scarce availability of complete information***

Information about product tests: the main difficulty in the preparation of the Deliverable was the scarce availability of complete information about the compliance verification tests developed by national Market Surveillance Authorities of Member States, and/or by other Authorities inside or outside Europe.

Even if information about tested products is known, the second problem is the availability of the data about number of tested products, specific models, parameters tested and above all the relevant test reports.

In most of the cases the verification of compliance is limited to the parameters that are considered most important for the specific products: energy consumption above all, and some technical characteristics such as the volume for refrigerating appliances. Very rarely functional performance - such as washing performance and drying performance in wash appliances and storage temperature or freezing capacity in refrigerating appliances - are verified, even if these functional parameters are strictly linked with the energy consumption of the models.

- ***Inconsistency of the MSA analysis and legislation provisions about product verification***

When test reports data are publicly available and Market Surveillance Authorities make their own analysis and evaluation, it is often reported that a model declared in class “X” (of energy efficiency or functional performance) belongs to a lower class “Y” when measured, irrespective of the fact that the values of the parameter(s) used for the calculation of the declared energy efficiency/functional performance class are compliant with the measured values (i.e. within the permitted verification tolerance).

A second inconsistency related to the verification tolerances is to consider a model non fulfilling the declared value, for example energy consumption, if the measured value is higher than the declared one and irrespective of the fact that it is within the accepted measurement tolerance. A footnote or a sentence is then added saying that in reality the model is complying with the declared value if the tolerance is taken into account.

The below example shows the two inconsistencies often found in the MSA analysis of test reports. The reality is that the model of refrigerating appliance shown as example is passing the Step 1 of the verification and it correctly belongs to A+ class that has been indirectly verified.

EU Energy Label	Energy Consumption (kWh/year)		Accepted Tolerance 15% (old label) or 10% (new label)	Energy Label		Passed/Fail
	Claimed	Measured		Difference (%)	Claimed	
new	292	302	3,50	A+	A	Pass*

*Consumption higher than claimed, but within tolerance limit

The problem lies in the different perception of some EU MSAs about the use of the verification tolerances, considered not as the (unavoidable) measurement uncertainty intrinsic of any test method and laboratory practice, but as a (undue) “legal” bonus given to suppliers that allows to “overdeclare” the products.

In this respect, it is worth reminding that the mis-practice of some suppliers using the tolerance on top of the measured values to achieve a better energy efficiency class is technically unjustified and illegal.

The worldwide experience on market surveillance shows that measurement tolerances are normally used in product verification outside the EU, with different accepted percentages depending on:

- the measurement uncertainty of the specific measured parameter under the applied test conditions
- the measurement accuracy of the selected testing laboratories
- the inclusion of the production variability in the verification process. Recently the EU has decided that control of the production variability is part of the overall quality of a product and has consequently excluded it from the verification tolerances of the ecodesign and labelling requirements.
- ***MSA complaints and perceived difficulties for the market surveillance***

In some cases the scarce information about tested products and test results are accompanied by a series of comments highlighting the still open issues, to be solved before an effective market surveillance could be implemented in the EU. Examples obtained within the Come On Labels project from individual countries are:

- ...even if an approach similar to that for safety controls is adopted for the verification of energy performance, it is not possible at the moment to ask for the withdrawal from the market of non-compliant models by Ministerial Decree. Indeed, the laboratories are not (yet) accredited for performance measurements (accreditation is expensive), and the standards are only partially harmonized. As a result, it is not possible (at the moment) to decide between the results of our laboratory and that of the manufacturer.

The imposition of carrying out tests on 3 other units in case of non-compliance, also limits the possibilities to move towards a ban. This will only be possible in cases of clearly proved erroneous indication.

Meanwhile, the checks carried out allow to inform the market that a monitoring is being installed (in particular of the accuracy of the indications on the label).

- 20 to 100 units a year from all product groups – typically only 10% are classified correctly if permitted tolerances are discounted, but about 80% are classified correctly if the legally permitted tolerances are taken into account.

Additional information on appliance testing best practice, obstacles and possible solutions can be found in the Come On Labels project's Deliverables "*National activities related information exchange of market surveillance actions & results*" and "*European Appliance test results exchange system*" available on the project website as of April 2013.

These two documents collect, summarise and highlight individual issues related to energy labelling market surveillance product testing. These, and other documents related to product testing are available on the project website:

<http://www.come-on-labels.eu/appliance-testing/appliance-tests-2011-2013>

REFERENCES

1. DEFRA, BIS; National Measurement Office, www.bis.gov.uk
 - a. NMO Press release - Washing Performance vs. Energy Efficiency, 22nd August 2011
 - b. Refrigerators & Freezers – Eco-design & Energy Labelling Compliance Project, October 2010
 - c. NMO Press Release – Energy Saving made through Market Surveillance Project, 4th July 2012
 - d. NMO Press Release - Smeg UK Energy Labelling Investigation, October 2011.
2. E3, The Efficiency Standard, issue N. 7, winter 2012, downloadable from: <http://www.energyrating.gov.au/resources/newsletters/?viewPublicationID=2415> .
3. E3, Check Testing Results, February 2012, An examination of the results of check tests undertaken for the Equipment Energy Efficiency Program between 1 July and 31 December 2011, downloadable from: <http://www.energyrating.gov.au>
4. ATLETE II project: <http://www.atlete.eu/2/>
5. ATLETE project: www.atlete.eu
6. ECOPLIANT project: www.ecopliant.eu
7. Energy Star US DoE: Energy Star Appliance Verification Testing – Pilot Program Summary Report, 3rd February 2012.
www1.eere.energy.gov/buildings/appliance_standards/pdfs/energystar_pilotprogram_report_02_03_12.pdf
8. Swedish Energy Agency: Market surveillance of energy related products – Nordic project.
9. SenterNovem, Annual report 2009, Energy label compliance in the Netherlands, December 2009.
10. Energy Saving Trust UK, <http://www.energysavingtrust.org.uk/>
11. Lock, T., Hindson, J.: Energy Saving Recommended: Key Principles for a Successful Product Labelling Scheme, EEDAL 2006 conference proceedings
12. Lock, Tom, Energy Saving Trust Recommended UK, Personal Communication, February – March 2013

Please, contact the Come On Labels organisers in case of your interest for more information about product energy compliance testing:

<http://www.come-on-labels.eu/about-the-project/contacts-eu>



Come on Labels project members – contacts

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	Austria	Austrian Energy Agency www.energyagency.at	
	Belgium	Brussels Energy Agency www.curbain.be	
	Croatia	ELMA Kurtalj d.o.o www.elma.hr	
	Germany	Öko-Institut e.V. , Institute for Applied Ecology www.oeko.de	
	Great Britain	Severn Wye Energy Agency www.swea.co.uk	
	Greece	Center for Renewable Energy Sources and Saving www.cres.gr	
	Italy	ENEA – Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile www.enea.it	
	Latvia	Ekodoma, Ltd www.ekodoma.lv	
	Malta	Projects in Motion www.pim.com.mt	
	Poland	KAPE , Polish National Energy Conservation Agency www.kape.gov.pl	
	Portugal	QUERCUS – Associação Nacional de Conservação da Natureza www.ecocasa.pt	
	Spain	ESCAN, S.A. www.escansa.com	



This document was prepared within the Come On Labels project, supported by the Intelligent Energy Europe programme. The main aim of the project, active in 13 European countries, is to support appliance energy labelling in the field of appliance tests, proper presence of labels in shops, and consumer education.

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More information about the project activities and all of its results are published on:

www.come-on-labels.eu