Draft Product Definition: Domestic Dishwashers

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1. Summary Definition and Categorisation

This document seeks to define the approach to be taken by the 4E Mapping and Benchmarking Annex when analysing Domestic Dishwashers.

The definition and categorisation for the product is shown in Table 1. Section 2 contains the rationale forthe product Categorisation. Section 3 explains the performance metrics. Section 4 examines some of the test methodologies in use and the approach to be taken related to a number of the interdependent variables that affect product performance. Section 5 lists the data that will be requested on the basis of the foregoing analysis.

Table 1: Simplified Product Categorisation Matrix

Definition and Scope	*A machine which cleans, rinses, and dries dishware, glassware, cutlery, and, in some cases, cooking utensils by chemical, mechanical, thermal, and/or electric means, normally through the use of water and detergent. The machine may or may not have a specific drying operation at the end of the programme.* The scope is to primarily include: • Single door built-in (this includes freestanding units in European definitions), portable and drawer-type dishwashers; • Both non-soil-sensing and soil-sensing unit. The scope will *exclude*: • Table top dishwashers (with fewer than 6 place settings)
Rated Capacity	6-16 place settings
Other Characteristics to be Notes	Wash Cycle Time Cleansing Performance Drying Performance Standby Functionality and Power Levels (Delayed Start, End of Cycle and Off) Load Type

2. Product Definition, Scope and Sub-Category Rationalisation

This section explains the rationale behind the summary definition presented in Section 1.

2.1 Product Definition

Although the specific wordings of definitions for dishwasher vary, almost all standards and regulations define a dishwasher as something similar to the following:

> *"A machine which cleans, rinses, and dries dishware, glassware, cutlery, and, in some cases, cooking utensils by chemical, mechanical, thermal, and/or electric means, normally through the use of water and detergent.. A dishwasher may or may not have a specific drying operation at the end of the programme."*

Proposal: As the product definition is almost universal, this definition will be adopted.

2.2 Product Sub-categorisation

Table 2 shows the proposed product category breakdown . Each aspect is discussed sections 2.2.1 and 2.1.2.

Table 2: Initial matrix definition of possible dishwashers.

		Aspect	*Possible Permutations*
A	**Technology**	Unit Type	Built in, Portable (including freestanding) and Table Top Dishwashers
B	**Technology**	Rated Capacity	From 4-16 place settings
C	**Technology**	Product Dimensions	Typically 600x600mm, 24"x24") and slimline (240mm x 600mm) although technically not restricted
D	**Technology**	Single Door/ Drawer	Normally a Single Door Unit, or one of more Drawers. However, technically no restriction
E	**Functionality**	Soil-sensing	Soil-sensing and non soil sensing units
F	**Functionality**	Length of Wash Cycle	Infinite possibilities
G	**Functionality**	Cleansing Performance	Continuous Scale
H	**Functionality**	Drying Performance	Continuous Scale
J	**Functionality/ Mode**	Stand-by	Technically "delayed start" is the only "functional standby", although other "standby modes" such as end of cycle, off power, etc are of significant relevance to the product energy use

2.2.1. Technology

Matrix Row A): Unit Type: Built in, Portable and Table Top Dishwashers

Dishwashers come in three primary varieties, built in, portable[1] and table top. A built in dishwasher is fixed in location (normally under a work surface or similar) and permanently connected to the water supply and drain. Portable dishwashers are typically of similar size but have caster (wheels) and are typically connected to a water supply (tap/fawcet) and appropriate drain when required. Table top units are typically smaller and are normally located on work surfaces or similar and again are typically connected to a water supply/drain as required.

Proposal: It appears that the number of table top dishwashers currently on the market in participant countries is limited. Hence, the inclusion of these machines in any analysis will lead to limited useful data for policy makers and may unduly influence outcomes. Further, significant penetration of portable units is limited to a small number of markets. However, as the approach of the mapping and benchmarking Annex is to define products based on functionality wherever possible, the built in and portable units are functionally identical. Therefore it is proposed that data collection and analysis will be undertaken for both built-in and portable dishwashers.

Should sufficient data be available, results will be presented in both aggregated form and broken down by built-in and portable units to identify any performance differences that may be of value to policy makers.

Matrix Row B): Rated Capacity

The rated capacity of the dishwasher is always defined as "the whole number of place settings and serving pieces which can be cleaned and dried when loaded in accordance with the manufacturer's instructions". However, a "*place setting"* (typically defined as a set of crockery, glass and cutlery for use by one person) and

[1] The phrase 'built in' is commonly understood in Europe to mean an appliance which is fully or partially integrated with the worktop and cupboards. It would normally be supplied without properly finished outer panels. The more common type which sits under a worktop but does not require additional fittings and does not integrate with other units is normally referred to as 'freestanding'. In this product definition, the North American use of the term "built-in" is being adopted which encompasses both European defined "built-in" and "freestanding" units.

the associated serving pieces are defined in the locally adopted test methodology. The specific make up of the place settings differ (for example the IEC and the AHAM loads used in the European Union/Australia and US/Canada respectively).

Clearly the type and quality of load is critical as the thermal capacity of the load effects the overall energy required to heat the water/load during the wash and (hot) rinse cycles; and the "heat energy" retrained by the load and the associated external heating required at the drying stage.

The most recent EU, Australia and Korean standards require the testing of machines with a load equal to their rated capacity, whereas the Canadian and USA tests require an AHAM load of only 8 place setting regardless of capacity (for machines rated at 8 setting or more). At present there is no known conversion factor that will reliably convert between these test loads, although some limited data on the impact of thermal capacity of the load has been made available.

Proposal: Investigations will continue to try and identify a correction factor based on the thermal capacity of the various load types and how this might be applied to normalise for energy consumption. Should this avenue not result in a sufficiently reliable approach to be used across all types of units, load of "equal number of place settings" will be considered as equivalent thermal mass.

Traditionally most dishwashers with capacities below 6 place settings and above 12-14 place settings appear to have had limited penetration in any market. However, in recent years units above 14 settings have begun to have significant penetrations in some markets.

(Note, Canada and the USA define units as compact if capacity is below 8 place settings, and standard if 8 place settings or above. There appears to be no similar categorisations in other markets, although recent EU regulations have begun to define minimum performance standards based on number of settings).

Proposal: In participant countries there are a limited number of dishwashers currently available with rated capacity below 6 place settings and above 16 place settings currently. Hence, the inclusion of these machines in any analysis will lead to limited useful data for policy makers, and may influence outcomes unduly. Therefore it is proposed that, wherever possible, data collection and analysis will be limited to units with rated capacity of between 6 and 16 units.

Attempts will be made to collect the performance data for dishwashers (and provide the associated mapping and benchmarking analysis for the machines) broken down by each rating between (and including) 6 and 16 settings, but some merging of groups may be necessary depending upon available data (eg 11-12 place settings).

Matrix Row C): Product Dimensions

Most built in dishwashers are of standard footprint of 600mm x 600mm (or the similar 24" x 24"). However, there are a significant number of slimline units on the market that fit a smaller (width) footprint, typically implied in more recent European legislation to be equal to or less than 240mm. Further, the re are a limited number of products with wider footprints, often draw units (see matrix row D discussion).

It appears slimline units sometimes have slight technical differences which may justify treating them as a separate classification (or excluding). However, as the approach of the mapping and benchmarking Annex is define products based on functionality, both standard and slimline units will be included in the analysis without differentiation.

Proposal: Include all built in dishwashers irrespective of footprint size.

Matrix Row D): Single Door/Drawer units

Most built-in and portable dishwashers have a single (normally drop down) door with various internal drawers/holders into which the load is placed. However, a limited number of dishwashers are of a "drawer" design where one or more drawers is pulled our horizontally with the drawer itself performing the function of both door and load container. While functionally these units have similar performance, technologically they are significantly different. Further, "drawer" design units have low market penetration.

Proposal: Although technologically different, drawer designs do perform the same function as drop down door units and will be included in the data collection and analysis.

Should sufficient data be available, results will be presented in both aggregated form and broken down by drawer type to identify any performance differences that may be of value to policy makers.

2.2.2. Functionality

Matrix Row E): Soil-sensing

A number of dishwashers have the ability to sense the degree and type of soiling present in the load. Such machines have the potential to automatically adjust the energy and water consuming aspects of a wash cycle in accordance with the soil load of the dishes.

Proposal: Appropriate (although varying) adjustments are made in all test methodologies to account for the energy and water consumption of soil sensing machines. As such, no specific segmentation is necessary, and no adjustment will be made for such machines during the analysis.

However, given the potential such machines have for reducing energy and water consumption, where possible data will be collected to establish the penetration of such machines in the market.

Matrix Row F): Length of Wash Cycle

For all test methodologies, the cycle is defined broadly as a complete washing, rinsing, and drying process defined by the programme selected, consisting of a series of operations. The time for the cycle is the time taken for the unit to complete this full cycle and return to a steady state condition.

The required programme for the product testing is always defined broadly *"as the full load programme for normal soiling, including any powered drying function where this exists"*.

All test methodologies have appropriate mechanism for adjusting for time/performance where the machine has additional functionality that affects the "normal" programme (eg adjustments for soil sensing machines) and consequently these can be ignored. The known exception is the Canadian and US measurements of energy consumption where units with an option to truncate the programme (ie turn off the powered drying cycle) have an allowance made for this functionality on the assumption that some users will elect not to use the drying cycle.

Proposal: As with all defined methodologies, it is proposed that the "cycle" is used as the functional performance unit for the machine, with energy, wash quality, drying effectiveness and water consumption measured based on a single cycle basis.

Where possible data will also be collected on the average cycle time to establish the relative impact of cycle time on the overall performance (energy, water consumption, cleansing ability, etc) of the unit.

Where possible units with truncated cycles will be "corrected" to full cycle times to be comparable with other data.

Matrix Row G): Cleansing Performance

Clearly the requirement to cleanse the dishes appropriately is the core function of the dishwashing unit. This cleansing performance is related to the degree of soiling of the wash and its adhesive properties, the size of the load, the loading pattern, the water temperature, the cycle selected, and a myriad of other factors including detergent, water hardness, etc. Obviously these variables affect the energy consumption of the unit. However, the various test methods measure the cleanliness of the load differently (and in some cases not at all). Further, even where a wash quality test is prescribed in the regulatory framework, not all regulations actually set minimum wash quality performance requirements, or require the reporting of a wash quality in publically available material/labelling (in Australia/New Zealand and Korea a minimum wash performance level is prescribed. The EU now also requires a minimum cleansing performance, although until very recently the performance simply had to be declared on the label).

Proposal: As few countries have a requirement to report wash quality, it has to be assumed that manufacturers have no incentive to improve cleaning performance beyond the level of cleanliness necessary to comply with regulatory minimum standards and/ or to satisfy the market. Any additional cleansing performance is a "premium service" for marketing purposes only and of no interest to the policy maker. Therefore no categorisation or normalisation for wash quality will be attempted.

However, for countries where wash quality information is available (primarily historic EU based data), attempts will be made to collect this data and analyse to establish any detectable correlation between wash quality and energy/water consumption (albeit within the context of national regulations).

Matrix Row H): Drying Performance

Among participating countries, the drying performance of the unit is measured in Australia, the EU countries and Korea, but not in the Canada and the USA (Japan unknown at present). Further, the performance in

Australia is based on an absolute measure with a required minimum performance level, while in the EU and Korea it is a relative performance level that must be declared. However, unlike cleanliness EU (and to some degree Australian) machines will be incentivised to provide a higher drying service as the drying performance must be declared (or meet a minimum standard). Clearly any powered drying service will be at the expense of energy consumption.

There is no known publically available information on the degree of energy impact of differing drying performances (or indeed the impact of the differing drying performance as measured in the EU and Australian methodologies).

Proposal: As there is no known conversion factor to normalise drying performance (and even if there was, only the EU countries and Korea declare this performance level), no categorisation or normalisation will be undertaken with other countries/regions, ie the drying performance of all machines across will be considered comparable.

However, where possible within EU countries and Korea, data on the drying performance will be collected in an attempt to establish any relationship between drying performance and energy consumption that may prove useful in future analysis and/or inform policy makers when considering the inclusion of drying performance in future regulations.

Matrix Row I): Standby Functionality

While the specific names and technical definitions vary, test standards and associated regulatory requirements tend to refer to one or more of the following functions/modes:

- **Delayed Start Standby Power:** The energy being consumed by a unit prior to the initiation of activities related to the cycle where the user has initiated such a delay prior to the programme commencing (for example, this may be to take advantage of a preferential time of day electricity tariff);
- **End of Cycle or Left-on Standby Power:** The energy consumed by the unit once the entire cycle has been completed but where no further consumer interaction has occurred;
- **Off Standby Power:** The energy consumed by the unit still connected to an energised power supply, but all user accessible controls are turned to “off”.

More recent regulations tend to include provision in annual energy consumption calculations for End of Cycle Standby power and (sometimes) Off Standby power. Few include Delayed Start Standby Power.

Proposal: While the various standby levels imply levels of unit functionality, units will not be categorised based on standby power. However, where data is available, mappings will detail average power consumptions for each type of standby and the benchmarking will attempt to separately compare each type of standby energy consumption and (where possible) will include in comparisons of total annual energy consumptions which include standby power.

3. Metrics

As noted above, for the majority of the analysis, the functional unit of performance will be the “normal cycle” including any washing, rinsing and drying activities.

The relevant performance metrics are:

Energy Consumption: Total Energy Consumption per Cycle (kWh/cycle)

Energy Efficiency: Total Energy Consumption per Cycle per place setting (kWh/cycle/place-setting), based on declared number of place settings

Other metrics to be investigated include:

Water consumption per cycle (litres/cycle) and per place setting (litres/cycle/setting)

Standby power of all types recorded (W)

Wash quality

Drying quality

Cycle time (minutes)

Noise

Whilst these metrics are widely used, there are differences in test methodologies which are explored below.

4. Test methodologies

The following standards for testing and/or regulation have been identified as those most relevant to much of the data likely to be submitted by participants. However, other standards are also of significance, eg the Japanese standard and are yet to be investigated.

- *AS/NZS 2007: Performance of household electrical appliances – Dishwashers, Parts 1 and 2 (issues in 1998, 2000, 2003 and 2005)*
- *EN 60436:2008: Electric dishwashers for household use - Methods for measuring the performance (and the superseded EN 50242:1999) and associated national derivatives.*
- *COMMISSION DIRECTIVE 97/17/EC of 16 April 1997 implementing Council Directive 92/75/EEC "… with regard to energy labelling of household dishwashers", and the subsequent COMMISSION DELEGATED REGULATION (EU) No 1059/2010 of 28 September 2010. More recently the COMMISSION REGULATION (EU) No 1016/2010 of 10 November 2010 implementing DIRECTIVE 2009/125/EC.*
- *C373-04, Nov 2004: Energy consumption test methods and limits for household dishwashers revised June 2005 and the preceding C373-92).*
- *ANSI DW-1-2004: Dishwashers (and the preceding ANSI DW-1-1992).*
- *U.S. Department of Energy Final Rule of August 29, 2003 (10 Code of Federal Regulation, Part 430 subpart B, Appendix C and 10 CFR 430.23)*

Some known differences in the testing standards, and the proposed approach to these differences, are investigated below. However, a full analysis of test methodologies has not been completed, pending input from participating countries.

Make up of Test Load

The tests loads used in participating countries are typically very similar to the "IEC" load and the "AHAM" load, although many standards have minor variations (eg Korea specify rice bowls not used elsewhere; the Australian load excludes serving pieces while the EU include serving pieces; etc). Clearly the specific make up of the load and number of items in the unit when under test has a direct bearing on the energy used to complete the test (see "differing test load sizes section), and the cleansing and drying performance of capacity of the units. However, for cleansing it is the overall surface adhesion properties of the material and the associated soiling (see "soiling agent" subsection) that is significant and the addition or exclusion of a small number of items is unlikely to be of major significance.

Proposal: The test standard IEC 60436:2004 provides options for the makeup of load to follow either the AHAM load or the IEC load and provides no indication of adjustments to be made in either case. A similar equivalence is given in the AS/NZS2007.1:2005 where the local load is considered equivalent to that of the IEC during a transition phase. While there are specific differences in detail (eg the inclusion and exclusion of serving pieces), for the general definition of load, the specific make up of test load a place setting (and associated serving implements when included) will be considered equivalent for all countries.

Differing Test Load Sizes

In all cases a *per cycle* energy consumption is calculated and adjusted for embodied water energy (this will be referred to as *Base Energy Consumption - BEC*). However, these consumptions vary based on the issue noted above, in particular:

- The nominal inlet temperature of the cold water;
- The load installed in the unit (type, number of settings and whether the load is clean or soiled)
- Other variables including detergent and rinse aid,

Proposals on how the energy impact of each of these variables should be approached are given elsewhere within this document with the exception of adjustments for the number settings and serving pieces used in the test load.

Proposal: Investigations will continue to try and identify correction factor based on the thermal capacity of the loads and how this might be applied to dishwashers given the initial water heating requirement and the retained heat between the wash, rinse and dry element of the cycles. Should this avenue not result in a sufficiently reliable approach to be used across all types of units, the following somewhat coarse approach will be applied.

As the AHAM and IEC load types are being considered identical within the current IEC standard, then it seems reasonable to conclude that energy consumptions of units of similar rated loads but differing test loads may be normalised based on a ratio related to their rated capacities and test load sizes compared with that in the EU (where rated load equals actual test load). To provide an example:

For units of 8 settings rated capacity, the test loads in both the USA/Canada and the EU are 8 settings. However, for units with 12 setting capacities, the EU test load is 12 settings, while the load in the USA/Canada is still 8 settings. Therefore, it is proposed the USA consumption would be normalised as follows:

> *Normalised USA/Canada Consumption for 12 setting machine = (average EU BEC for 12 settings/average EU BEC for 8 settings) x USA/Canada BEC for 12 setting machine.*

An approach to deal with the issue of inclusion and exclusion of serving pieces will be developed if possible.

(Note that is it recognised that this approach to normalisation is not perfect and the degree of error incorporated is unknown – therefore suggestions on alternative, more accurate approaches to normalisation are requested, in particular based on the thermal capacity of the loads as outlined above).

Water Inlet Temperature (and Embodied Energy)

Test methodologies vary in nominal cold water inlet temperatures, but all account for the variations in embodied energy relative to this inlet temperature (via simple calculations based on the specific heat capacity of water). Specifically, nominal water inlet temperatures are:

- Australia: 20°C
- EU Countries, Korea and Switzerland: 15°C
- Canada and the USA: 10°C
- Japan: To be confirmed

Proposal: Energy embodied in water (per cycle) will be normalised to a single nominal cold water input temperature. To minimise the number of countries being normalised, the nominal EU inlet temperature (15°C) will be used.

Normalisation of cycle energy consumption will be based on the addition of embodied water energy for the entire water intake where:

> *Additional embodied energy = total water consumption in the cycle (litres) x the specific heat capacity of water (0.00115kWh/L °C) x (15°C -nominal local water inlet temperature in °C)*

Note this will be a negative value for countries where the nominal temperature is above 15°C and a positive value for nominal temperature is below 15°C

Water Consumption

The quantity of water introduced into the machine obviously has a degree of impact on the wash performance of the unit and the associated energy consumption. Further, water consumption is becoming an increasingly relevant issue for policy makers and consumers.

All test methodologies require the measurement of water consumption throughout the entire cycle with appropriate adjustments for units with functionality such as soil sensing units. However, not all regulatory regimes require the declaration or regulation of water consumption. Further in Canada and the US water use during condensation drying is not considered part of the cycle water consumption.

Proposal: Given the similarity in measurement of water consumption over the full cycle, the measurement of water consumption in different country/regions can be considered comparable.

Information on water consumption will be collected to enable comparisons of:

- *Absolute water consumption between regions*
- *The relative impact of water consumption on energy consumption and wash performance.*

(Investigations will be made to see if it is possible to take account for the water consumption during condensing drying in US/Canadian models)

Soiling Agent

The soiling agents are the food and other materials that are added to load for certain test procedures to simulate the material that would need to be "cleansed" during a normal operation in the home. It is the removal of these items that defines the cleaning performance of the wash.

The various test methodologies differ in the specific make up of the soiling agents (typically something similar to eggs, milk, meat, oatmeal tea and margarine with some regional variations such as Kimchi in Korea); the methods of application to the load; and the number of pieces of the load to which soiling is applied. Further, in some regulatory regimes (for example Australia and the EU countries,) it is necessary to perform the energy consumption test (and associated test for cleanliness) using a soiled load, while in other regulatory regimes (eg Canada and the USA), the energy test is performed with an unsoiled load except where consumption is being adjusted for "soil-sensing machines"

Proposal: The specific type of soiling, application and amount has an intrinsic impact on the performance of the machine as it impact on the basic design of the machine and the requirement for water heating, type of detergent and the ultimate cleanliness of the wash (and the associated energy consumption) depending upon test methodology. Unfortunately, at this time, no information appears publically available on the "relative" impact of soiling (and the related local specification of detergent, etc) on overall performance. Therefore, it is provisionally planned that no normalisation will be made for differences in test load soiling pending participants having information on the relative energy consumption impacts of the various soiling types/methods.

Water Hardness

Water hardness has a minor effect on the performance of the units as shown by the precise nature of the water hardness specification in the IEC and derivative test methodologies, and the associated instructions for machines with water softening units etc. Further, the impact will be variable dependent upon the specific water hardness specified and the associated wash temperature and detergent used, all of which differ. However, the precise nature of this impact is not known (as evidenced by the ongoing IEC research), but is thought to be relatively small, particularly on new machines and test loads where there is no build up of limescale.

Proposal: Given the potential variations in water hardness and associated local requirements for items such as detergent, and the limited impact anticipated, water hardness will not be considered in the mapping or benchmarking process.

Detergent/Rinse Aid

The detergent and rinse aid has a direct impact on the cleaning and drying ability of the unit under test. However, this impact on performance is variable dependent upon many factors. However, given the proposed approach is not to attempt to normalise the wash and drying performance between countries where these is such a declaration, the impact of the detergent on these performance criteria can be ignored in these instances.

The impact of the detergent on the washing temperature (and hence energy consumption) is of significance as the specific type of detergent (eg one with specific enzyme content) will affect the temperature at which the unit is designed to enable high test performance. However, at the time of preparation of this product definition, there appears to be no known conversion factor that will account for the change in energy performance necessary for the various detergent formulas specified in the different tests.

Proposal: No normalisation will be made for water hardness, detergent or rinse aid in the determination of wash quality or drying performance.

(Participants are requested to provide knowledge of the energy impact of the various detergents specified in the differing test methodologies. In the absence of such knowledge becoming available, no normalisation will be made for the impact of differing detergents on energy consumption.)

Acoustical Noise

The limitation of noise has some impact on the performance and capacity rating of the machine simply due to the change in internal geometry of the machine and the external insulation necessary to minimise noise. However, the measurement and declaration of noise is limited to a few countries and in general is thought to have limited overall impact on machine performance[2].

Proposal: Collect information on unit noise where available to establish whether noise appear to impacts on energy or water consumption.

5. Product Segmentation for Identification of Best in Class

If participants wish to proceed with a Best in Class analysis, it is *proposed* the classifications of product are:

Segmented by: Soil-sensing and non-soil sensing machines

Subcategory: Rated capacity in groupings of 6-7 settings, 8-9 settings, 10-11 settings, 12-13 setting, 14-15 settings. 16 settings.

Depending on data availability, investigations may also be made slimline and drawer type sub-catagories.

6. Data requirements

To enable the most effective analysis of data and comparison between countries, we would like to collect the data listed below

6.1 Information on new products on sale

The following information is desired for all years available between 1997 and 2011. Ideally this will be in the form of **individual model information** as this will allow additional analysis (eg o Best in Class). However it is recognised not all information will be available in all countries and, where individual model information is not available aggregated market data is of value**:**

Brand/Model identifier

Rated Capacity (in place settings)

Energy Consumption per Cycle excluding Standby

Standby Consumption in Off-mode, End of Cycle Mode and Delayed Start Mode

Water Consumption per Cycle (ideally divided into wash and rinse)

Cycle Time (including tag for units with truncated cycles)

Wash Quality

Drying Performance

Annual Sales

Acoustical Noise

Tag for whether the unit is soil sensing

Tag for if the unit is slimline (or provision of the unit dimensions)

If local labelling (eg star, a-g scale, etc) – grade of model and/or index value (eg EEI in Europe) if available

Annual number of assumed wash cycles (not model specific)

[2] Although there is some evidence from the EU suggests the insulation for noise reduces insulation for heat and can lead to increased energy consumption).

6.2 Information on stock and sales

For all years available between 1997 and 2011:

Total national stock of products in service

Estimated total annual (or cycle) energy consumption of units in stock (specify if this includes or excludes standby)

Estimated average efficiency of stock (Energy Consumption/Cycle/Place Setting)

Estimated annual number of washes

Estimated average number of place settings of stock

Estimated total annual (or cycle) water consumption of units in stock

6.3 Additional Information Required for Data Processing

Test methodology(ies) used to derive the data, and any relationship to known international standards (e.g. EN *XXX*; clone of test method XYZ [with these amendments: A, B and C], etc.)

Regulatory, declaration requirements or other local requirements that affect product performance (eg MEPS, Labelling, etc)

Dates at which any changes to test methods and/or regulatory/declaration requirements occurred during period of reported data.

6.4 Additional Information Required for Other Planned Analysis

Summary of all major policy actions affecting dishwashers over the period data is available including whether voluntary or mandatory, the year when policy was first considered, the year of formal announcement of the policy plans, and the year when the policy came into force.

Summary of any cultural or other issues that are thought to affect this product at the local level.