

Introduction to proposals for Ecodesign requirements for Lot 1 (Boilers) and Lot 2 (Water Heaters)

1 Size of Savings

The cost effective savings potential from Boilers and Water Heaters is very large. The products covered by the lot 1 and 2 studies account for almost a quarter of EU CO² emissions. The studies show that at the LLCC level the savings potential is around 30%, or around 6% of total EU CO² emissions (current LLCC level v. average currently sold).

The proposals described here will lead to an overall reduction in CO² emissions of about 190 Million tonnes in 2020 (120Mt boilers, 70 Mt water heaters) and over 280 Million tonnes in 2025 (180 Mt Boilers, 100 MT Water Heaters). They represent an estimated overall annual saving to the public (after higher investment costs) of around 60 Billion € in 2020 rising to 150 Billion € in 2025 (over 1% of GDP).

The overall effect on the manufacturers and installers of boilers and water heaters should be positive. The estimated total revenue for the purchase and installation of boilers and water heaters doubles by 2015 (compared to BAU) and by 2020 is around € 95Billion as against €45 Billion under BAU.

2 Source of Savings

In discussions with stakeholders to date, there has been concern expressed that the major market transformation needed to achieve these savings will not be easy to achieve in practice, and will cause a number of problems. However, there has not been any major disagreement that the savings suggested are technically feasible, and cost effective.

The analysis shows that it is not enough that the burner/heat exchanger assembly is efficient at steady state, but that it should be part of a well designed system comprising heat generator, pumps, controls, and perhaps heat pumps or solar etc. that are optimized to work efficiently in response to the varying demands (and operating conditions) placed on it. The model presented in annex gives a robust estimate of how well any particular combination can be expected to do this. Some of crucial elements appear to be:

1. Smart controls to ensure that the individual rooms are heated only as much as required.
2. Hydraulic balancing (and controls) to minimize the water return temperatures.
3. Appropriate contribution of renewables (solar, heat pumps)

3 Scope of Ecodesign

The Ecodesign directive is a 'harmonization' measure passed under Article 95. Its core are controls over what can be 'placed on the market'. As such its requirements place responsibility on Manufacturers (and importers). If we need to directly involve other stakeholders (building owners, installers, etc.) we may need to use other legislative means. This will probably involve new codecision measures, such as a revision of the Energy Performance of Buildings Directive 2002/91/EC¹(EPBD).

4 Responsibility for energy efficiency

It is clear from the analysis that designing such an efficient configuration is not a trivial task. It requires professional expertise (design engineer, architect, etc). Using these services for an individual system will be expensive (in € 1000s) and there is not sufficient capacity to cover all new installations (15-20 million water heaters and 6-8 million Boilers per year).

In this context we need to consider how best to achieve these savings while minimizing the disruption to the market, and the cost to all stakeholders. Optimizing this balance may require a mixture of the product-oriented approach within the scope of Eco-design and Energy Labelling, with application-oriented measures such as the EPBD.

The stakeholders involved in the selection, purchase and installation of a boiler and heating system include:

1. Building owner, tenant, occupier, and payer of fuel bill (may be several persons)
2. Installer
3. Manufacturer (of boiler, and other components).
4. Enforcement authorities (national/local governments)

4.1 For smaller systems (Boilers up to size XL, – lifecycle cost under €100 000, and water heaters at least up to up to size XL – lifecycle cost under €12 000) in general the

1. Owner will have no professional expertise – but may want to have some simple information about the performance of the system
2. Installer (plumber) will in general have insufficient time (or desire) to maintain the necessary level of professional expertise.
3. Manufacturers will be well placed to produce product packages optimized in respect of the model.
4. It would be costly for the enforcement authorities to inspect individual installations, and there would be serious problems in training and recruiting necessary inspectors.

Moreover, the consultants analysis suggests that a well designed 'package' will provide an efficient heating system in the vast majority of mainly household or small to medium commercial premises in which it will be installed (provided it is correctly sized).

¹ Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings *OJ L 1, 4.1.2003, p. 65–71*

On the basis of the above, it appears reasonable to put the primary responsibility for ensuring that the package supplied is energy efficient and has a low environmental impact. This implies a holistic product definition and suggests the appropriate main policy measures will be Ecodesign requirements, coupled with Energy labelling aimed at providing the building owner with easy to understand information about their choice of 'heating packages', and some fairly light measures to encourage correct sizing

4.2 For larger systems (Boilers size XXL and above, – lifecycle cost over €100 000 – only 4% of sales, but 35% of energy consumption) in general the

1. Owner will have professional advice (architect, HVAC engineer, etc) to help choose the boiler and other elements of the system.
2. (larger) Installer will be more likely to have professional expertise.
3. Manufacturers will still be well placed to produce product packages optimized in respect of the model.
4. It would be easier for the enforcement authorities (for example) to inspect the plans for each installation, and carry out checks that they have been installed as planned.

Although the consultants analysis suggests that a well designed 'package' will provide an efficient heating system in the vast majority of premises in which it will be installed (provided it is reasonably correctly sized), a larger deviation between general model calculations and individual EPBD type calculations (up to 5-10%) may be expected. There is a larger variety of building types to be heated (hospitals, sports facilities, cinemas, offices, blocks of flats, etc.), and the requirement to use renewables input (as it is cost effective in this size range) will mean a larger variation. This larger variation is anticipated in the 16% band width for the higher efficiency classes.

On the basis of the above, it appears reasonable to share the responsibility for ensuring that the package supplied is energy efficient and has a low environmental impact. The above suggests the appropriate main policy measures will be Ecodesign requirements, combined with installation requirements (possibly under a revised EPBD), and Ecodesign information requirements aimed at providing the building owner with the needed technical information to make their own estimates of the running costs and other elements needed to help them choose an efficient and low environmental impact heating system.

Given the size and large energy consumption of these configurations, it will also be worthwhile to provide for monitoring equipment to ensure that the system is properly installed and is functioning correctly.

4.3 For larger Water Heaters (size XXL and above, lifecycle costs over €12 000) all stakeholders may well be professional. However, the principal choices may be :

- between central and distributed system (particularly in residential systems – blocks of flats etc.),and
- of water heater

Ecodesign measures (combined with Energy labelling) may be sufficient for the second choice, leaving the first to be covered by a possible EPBD measure.

5 Other Policy Measures

The attached working document for CH Boilers, and Water Heaters sets out:

- Eco design Measures for CH Boilers and Water Heaters (and Combis)

For the same products, It also includes an outline of:

- Energy Labelling Measures
- Installation requirements, and
- Recommendations to Member States.

The analysis in the VHK study makes it clear that we may need to take action in the field of other heating and water heating products. Within the scope of lots 1 and 2 (CH Boilers and Water Heaters) other products that need to be considered include:

- (stand alone) **Circulators** included in lot 11 (and to be considered by the forum in the near future)
- **Hot Water Storage Tanks**: see attached draft study from VHK. Please send comments to DG TREN D3. and
- **Controls**

The implication of the VHK analysis is that there is a large scope for energy savings by retrofitting existing heating systems with improved controls. Consideration is being given as how best to support such improvements. This could include, Ecodesign measures, Energy Labelling, support schemes etc.