ANNEX VII

Measurements and calculations

4. **Seasonal space heating energy efficiency and consumption of heat pump space heaters and heat pump combination heaters**

(a) For establishing the rated coefficient of performance COP_{rated} or rated primary energy ratio PER_{rated}, or the sound power level, the operating conditions shall be the standard rating conditions set out in Table 9 and the same declared capacity for heating shall be used.

(b) The active mode coefficient of performance $SCOP_{on}$ for average, colder and warmer climate conditions shall be calculated on the basis of the part load for heating $Ph(T_j)$, the supplementary capacity for heating $sup(T_j)$ (if applicable), and the bin-specific coefficient of performance $COPbin(Tj)$ or bin-specific primary energy ratio $PERbin(T_j)$, weighted by the bin-hours for which the bin conditions apply, using the following conditions:

— the reference design conditions set out in Table 10;

— the European reference heating season under average, colder and warmer climate conditions set out in Table 12;

— if applicable, the effects of any degradation of energy efficiency caused by cycling, depending on the type of control of the heating capacity.

(c) The reference annual heating demand Q_H shall be the design load for heating $Pdesignh$ for average, colder and warmer climate conditions, multiplied by the annual equivalent active mode hours H_{HE} of 2 066, 2 465 and 1 336 for average, colder and warmer climate conditions, respectively.

(d) The annual energy consumption Q_{HE} shall be calculated as the sum of:

— the ratio of the reference annual heating demand Q_H and the active mode coefficient of performance $SCOP_{on}$ or active mode primary energy ratio $SPER_{on}$; and

— the energy consumption for off, thermostat-off, standby, and crankcase heater mode during the heating season.

(e) The seasonal coefficient of performance $SCOP$ or seasonal primary energy ratio $SPER$ shall be calculated as the ratio of the reference annual heating demand Q_H and the annual energy consumption Q_{HE}.

(f) The seasonal space heating energy efficiency η_s shall be calculated as the seasonal coefficient of performance $SCOP$ divided by the conversion coefficient CC or the seasonal primary energy ratio $SPER$, corrected by contributions accounting for temperature controls and, for water-/brine-to-water heat pump space heaters and heat pump combination heaters, the electricity consumption of one or more ground water pumps.

(g) The annual energy consumption Q_{HE} in kWh in terms of final energy and/or GJ in terms of GCV shall be calculated as the ratio of the reference annual heating demand Q_H and the seasonal space heating energy efficiency η_s.