Additional information on the Proposed Methodology

"Energy Saving by Introduction of High Efficiency Screw Chiller(s)"

1. Identification of reference cooling system

In Vietnam, chiller manufacturers, such as Company A, Company B, Company C, Company D and Company E occupy relatively high market share in chillers market.

To supply cold water by cooling system with cooling capacity up to 300 USRt, a screw chiller is widely used. Both water and air are commonly used as the coolant for condensers in chillers, however, the water-cooled chiller is generally more efficient than air-cooled chiller.

Taking these into consideration, the reference cooling system in this proposed methodology is assumed to be water-cooled screw chillers.

2. Research on COP values of reference chillers and identification of reference COPs

A research on COP values of reference chillers was conducted through collecting catalogues of standard water-cooled screw chillers manufactured by major chiller manufactures which have their websites for the Vietnamese market. Chillers using HCFC as refrigerant are excluded in this research.

As a result, 2 companies (2 models) were identified and 22 COP values are collected as shown in Figure 1 below within the range that cooling capacity is less than 300 USRt. These COP values are standardized with the equation as indicated in Criterion 2 in the proposed methodology.

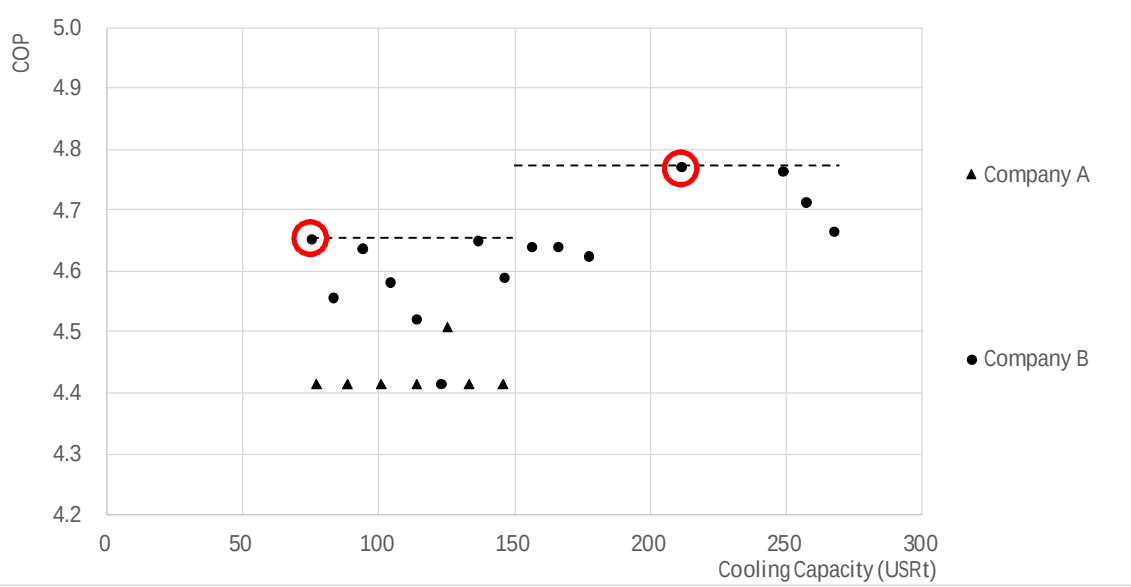

Figure 1 COP values of water-cooled screw chillers

It is observed that similar COP values fall into a certain cooling capacity range. Therefore, two cooling capacity ranges are set to determine the reference COP values for each range. The most

efficient COP in each capacity range, which is shown in red circles in Figure 1 above, is selected as the reference COP to ensure net emission reductions.

The COP of reference chiller ($COP_{RE,i}$) for each cooling capacity range is determined and shown in Table 1 below. ("x" in the table represents cooling capacity per unit)

Table 1: Established $COP_{RE,i}$ default values for the proposed methodology

Cooling capacity per chiller (USRt)	75≤x<150	150≤x<270
$COP_{RE,i}$	4.65	4.77

*1 USRt = 3.52 kW