

Dear NABERS,

One area that I believe requires some clarity is how energy input associated with waste heat is apportioned to the useful outputs of the tri/co-generation systems.

The ruling is clear enough on the requirement to disclose all the energy inputs for the tri/co-generation systems, and the need to measure the outputs. It also states that the energy associated with waste heat is not to be excluded. The issue, as I see it, is how the energy associated with the waste heat is attributed to the energy outputs.

Consider the fundamental energy balance of a typical system:

Gas energy in=electrical energy out + thermal energy + waste heat

Let us say the split is 40%/40%/20%

If a site was to, say, export all the electrical energy and use all the thermal energy on site. By way of example let us further say that 100GJ of gas went in to the system. What would stop a user declaring only the 40GJ of thermal energy used on-site and exporting/excluding 60GJ of gas use saying it was totally associated with the production of the 40GJ of electrical energy exported? i.e. attributing all the waste heat to the exported stream thereby making the onsite uses look more energy/CO2 efficient. In this case all the energy associated with the waste heat has been accounted for but to the benefit of the rated premises. A policy is required to deal with how this energy is accounted for e.g. equally between the usable output streams or some pro-rata scheme

Another area requiring some more investigation is the exporting of cooling thermal energy.

In the cases of exported cooling energy from absorption chillers it is also critical to establish the heating thermal energy input provided to the absorption chiller and not just the cooling thermal energy exported. This is required to take out variable coefficients of performance effects of the absorption chiller as there is no direct relationship between the cooling thermal energy output to the gas energy input to the tri-generation system. The above equation would become more complicated

Gas energy in=electrical energy out + waste heat + (cooling energy out/absorption chiller COP)

Where the absorption chiller COP is a variable and currently not being measured as only the exported energy, in this case cooling thermal energy, is required to be measured. In order to accurately measure the amount of input energy required to generate the exported usable energy the intermediate measurement of thermal energy provided to the absorption chiller is required.

Peter Lowndes

Principal Mechanical Engineer
D +61 2 8934 0495
Peter.Lowndes@aecom.com

AECOM

Level 21, 420 George Street, Sydney, NSW 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000 F +61 2 8934 0001
www.aecom.com