Overview of 1st NCP Meeting, Portugal

12th January 2015

The National Consultation meeting for Work Package 3 - Estimating RHC energy costs, Cost Estimation Methodology, took place on January 12th 2015, with 17 participants from different stakeholders.

After a brief presentation of the proposed Cost Estimation Methodology, the participants were able to discuss a set of question put forward by the organization.

The first point of the discussions was about the **proposed equation** for the calculation. It was clear for most of the participants that the units (€ + €/kWh) did not add up. Therefore a recommendation was made to organize the elements of the equation so that this particular issue can be settled. A revised equation was proposed so that the units will add up.

The second point of the discussions was about **discount rate**. On this point, it was agreed the following:

Discount rate translates the risks associated to a particular investment and its value depends on the investor, who needs to evaluate the risks that he or she is willing to take.

Risks are associated to the maturity of the technology and can be associated to different phases of technology development and deployment. Considering that investment risk changes with the technology and location, discount rate should change in function of technology and location.

Discount rate related to location of the technology might not make sense, since the risks associated to the location are reflected on the energy been delivered by the system.

It might be useful to have the risk defined in terms of low, medium and high, depending on the maturity of the technology.

For the case of geothermal energy in particular, since Portugal does not have geothermal maps, with indication of the resources, it is not adequate to have location based discount rate because there are no tools that will support such decisions.

A discount rate based on technology will always be related to its maturity and could trigger a dispute between different technologies. It is recommended that the question of risks, which are translated into different discount rates, should be left to the responsibility of stakeholders.

The following point of discussion was about **capital expenditure, CAPEX**. It was agreed that CAPEX should integrate all the expenses related to the HC system. For example, in the case of a solar thermal system, it should also include the costs related to the backup system. It could be presented in different units, for example €/m^2 for solar systems, €/kW power for a biomass system and €/ton for ground source heat pump. However, for comparative purposes among technologies, different units for CAPEX might not be practical. It might be useful to estimate investment in function of annual energy generated.

The fourth point on the agenda was about **operating and fuel cost, OPEX**. The group was asked to *consider the complexity of estimating the future operating and fuel costs of certain technologies (e.g. electricity costs for heat pumps and feedstock costs for biomass).* On the question, it was agreed that OPEX should include costs related to fuel and electrical energy used to help power the system (renewable and backup unit). It should also include insurance costs and costs related to monitoring / inspection. OPEX costs reflect the maturity of the technology. A mature technology might need less maintenance than the one which is just appearing on the market.

A discussion on the **economic lifetime** was the next issue. It was agreed that economic lifetime is the time that the investor decides to leave the system. In a normal situation it is defined by the investor and it might coincide with technical lifetime. Lifetime of a RHC system can be defined as the time in which the system is no longer rental. Technical lifetime of equipment is fundamental to economic lifetime. On the other hand, there is very sparse studies, statistical data or even relevant information on technical lifetime of equipment, which makes it difficult to choose economic lifetime.

In discussing the residual value, it became clear that it is important to evaluate the quality of the energy been generated versus OPEX costs for a

degrading RHC system. For this particular case, there can be different possibilities:

The costs of keeping the system working might not justify the operation. Therefore the residual value might be considered null.

The costs of keeping the system working might justify the operation.

Residual value can be estimated as a percentage of the annual savings.

Residual value might be estimated as a percentage of the initial investment

The residual value can be considered zero whenever the system does not generate energy. In some situations, the owner will have additional expenses for the removal of the components of an obsolete installation.

Finally, the value of energy generation was considered renewable plus back system, since the owner will have the full energy service.

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