

Heat metering, efficient heat cost allocation and billing - Challenges and Opportunities

The point of view of public, cooperative and social housing

Draft

Introduction

When looking at energy issues, public, cooperative and social housing providers have generally the same approach: creating a robust, long-term energy efficiency improvement strategy to ensure housing remains affordable by reducing energy consumption and fuel poverty and integrating this strategy into asset management programmes to help ensure that programmes are cost-effective and also helps to minimise disruption for residents¹.

Essential instruments of this strategy is to help tenants to take control of their energy usage and make lifestyle changes to save money, improve comfort and deliver positive health outcomes. There is a wide range of techniques to achieve this objective, one of the most well-known being the metering systems. In the following we will explore the potential benefits and limits to the use of smart meters in the public, cooperative and social housing sectors.

1. Improved metering systems : one piece of the puzzle for the empowerment of residents

Driven by the ambition to provide a sustainable, affordable and responsible housing, many providers of public, social and cooperative housing have linked their refurbishment and new build activities with an increased cooperation with and involvement of tenants and residents in their programmes. One of the reasons (beyond the willingness to implement tenant's democracy) is that change of behaviour in matters of energy can help reduce the energy consumption. Earlier projects and more recent surveys have indeed confirmed that a significant percentage of the total energy consumption of a household can be saved thanks to a change of energy consumption patterns². A crucial point however is that to help tenants to take control of their energy usage and make lifestyle changes to save money, improve comfort and deliver positive health outcomes, housing providers have used for many years now different techniques: home visits, illustrative guides, community events, and smart meters.

The focus laid down by the Energy efficiency directive (Articles 9, 10 and 11 and Annex VII of Directive 2012/27/EU on energy efficiency) on metering and billing of individual consumption of energy comes from the fact that without an adequate frame of reference, consumers cannot know whether their consumption is excessive or not. Meters (even smart meters) have been deployed

¹ See for instance national housing federation guidance note on energy efficiency : http://s3-eu-west-1.amazonaws.com/pub.housing.org.uk/Funding_Retrofit_Briefing_Sept_2014.pdf

² See for instance the European Environment Agency: <http://www.eea.europa.eu/highlights/can-we-save-energy-by>

since a few years in the housing stock of many providers. In many instances, results are positive only if measures are well designed together with tenants, implemented together with other supportive initiatives (aiming at engaging residents) and obviously technically feasible and cost effective.

2. The human and technical challenges behind metering systems

The installation of individual meters, in particular smart meters, relates to human and technical challenges. Several projects have highlighted them. For instance the E3soho project aimed at *“implementing and demonstrating in social housing pilots an integrated, interoperable and replicable ICT-based solution which aims to bring about a reduction of energy consumption in European social housing, by changing the behaviours of tenants towards energy efficiency without compromising their comfort”*. Among the interesting lessons from the projects we can note the following:

- Users' acceptance in terms of user interface friendliness, accurateness of the information provided, and credibility of the ICT technologies implemented is key in changing their behaviours
- Tenants are quite satisfied with the solution considering functionalities, interface, and installation process (even if they got technical problems, mainly on connection issues)
- The use of this new technology continues to be complicated for some sectors of the population: elderly people, foreign people. It would be convenient to develop specific communication means adapted to the elderly (e.g. television)
- Savings are on the same range as “natural evolutions” or typical saving measures, or influence of the awareness itself

3. The cost efficiency argument : experiences from some Member States

3.1. Sweden

Legal situation: Building owners shall give the possibility to measure heating, cooling and hot water individually in each apartment. However, the requirement applies only if the measure is cost effective and technically feasible. The Swedish National Board of Housing Authority has proposed that no case shall be subject to individual metering of heat, cold or hot water in new construction as it is not cost effective. The Board will in 2015 investigate whether there should be a requirement in existing buildings on individual metering.

Reality check: In Sweden heating and hot water costs are included in the rent bill and the costs can be quite low. With district heating systems in summer costs can be as low as 1 c/kwhr - 75 per year could be enough to cover heat and hot water. The fixed costs are relatively high

compared to the costs linked to actual consumption so this also reduced the incentive to reduce consumption. This means that the investment cost is much higher than the potential savings.

3.2. Austria

Legal situation: Individual metering is required.

Reality check: the costs for metering are about 80€ per dwelling and year (district heating). In a (very) low energy building you pay about 200€ per year for heating (without hot water), after deduction of fixed costs. It means, one needs to save about 40% heating to compensate for metering. When heating bill is 600€ per year, the 80 € account to 13% of consumption. That is a level within the range of a possible variation of heating consumption.

3.3. Denmark

Legal situation: the Danish Energy Agency defines cost-efficiency (profitable) when the energy savings throughout the life span of the meter will be higher than the investment of installing and purchasing the meter

Reality check: for all meters in DK (heat, water and electricity) there are very high connection (to the grid/infrastructure) fees and other fees. These fees are fixed costs and so there is only a very little percentage of the total costs of installing individual metering (variable costs) that can actually be effected by behavioral changes due to individual metering. This again means that looking at the lifespan of a meter there is no way that the savings, since they will be such a small part of the total costs, will be higher than the investment.

3.4. France

Legal situation: For new buildings, the Thermal Regulation 2012 dedicated to new constructions and applying from 1 January 2013 provides that as per Article 23 « the individual or terraced houses and buildings or parts of residential buildings are equipped by systems being able to measure or estimate the energy consumption of each dwelling”. For existing dwellings: « Every apartment building that is occupied for private purposes, with a common heating to all parties providing each tenant with adjustable heat quantity, should be equipped with devices that individualizes collective heating costs. »

Reality check: those requirements could help both tenants and providers to have better information about the actual energy consumption. But there are some uncertainties: probable lower economies of scale in small buildings, uncertainty regarding the general cost efficiency of the measure, uncertainty regarding the ownership/interest of the measure for tenants.

4. The success factors

In parallel to the affordability challenges described above, the experimentations regarding the use of smart meters and other techniques to change the behaviour in the field of energy consumption have led to some conclusions on what the success factors should be³:

- Engagement should not take a one-size-fits-all approach as different participants favoured different techniques.
- Personal engagement with households, whether face to face or through phone calls, was most effective at getting and maintaining buy-in
- Engaging with all members of a household
- Locally-based staff who had established rapport with residents helped to overcome mistrust or scepticism, particularly among elderly residents
- Keeping messages simple focused and tailored where possible. Regular reinforcement of messages helped embed good habits over the long term
- Framing messages around staying comfortable, avoiding wasting money and the successes of other, similar households
- Taking an organisation-wide approach to engagement and linking it with other outreach activity, such as that around welfare reform or household budgeting.

To put in place those success factors generates costs which are usually not taken into account when calculating the cost efficiency of installing meters.

5. Conclusion

The experience within the public, cooperative and social housing sectors shows that individual heat metering and billing is feasible in some countries, but not others because of the ways homes are built and because of the existing regulations in the field of rent and energy bills. However, even in those countries where it is feasible, improved metering systems is only one way to achieve behavioural change in the field of energy consumption of household. Alone they will not deliver on the energy savings that we want to achieve, in particular in countries and situation where their installation is clearly not cost effective. But they can be, if cost effective, a good tool for a strategy to empower residents and make sure they have a certain control on the energy transition. In any case, any measure related to metering systems should take place within the framework of a multi-faceted approach to energy efficiency (combining access to finance, training of professionals, use of renewable energy to decrease the overall carbon footprint) whereby residents and tenants have an important role.

The regulatory framework (in particular the EED) should be supportive and give the national and local level the possibility to find the most appropriate solutions for a fair energy transition. What is

³ See the NHF project Count us in : [http://s3-eu-west-1.amazonaws.com/pub.housing.org.uk/Count Us In Lessons Learnt 2014-updated.pdf](http://s3-eu-west-1.amazonaws.com/pub.housing.org.uk/Count%20Us%20In%20Lessons%20Learnt%202014-updated.pdf)



crucial is to agree on ambitious energy and climate goals and to reach real energy efficiency. Then it should be up to the member states, national and local level to design strategies on how to reach them.