



Equity Impacts of Energy Submetering & Low Carbon Building Policies

Project Summary

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This project was conducted under the mentorship of City staff. The opinions and recommendations in this report, and any errors, are those of the author, and do not necessarily reflect the views of the City of Vancouver or The University of British Columbia.

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Project Summary

Introduction

This study was initiated by the City of Vancouver's Neighbourhood Energy Utility (NEU) and the Sustainability Group to provide insight into the regulatory environment and business practices of suite-level sub-metering of thermal energy services in the Vancouver area. As this is a relatively new type of commercial arrangement involving essential utility services and is not subject to Provincial regulatory oversight that apply to utility services, this report seeks to map out current practices and identify benefits and drawbacks for the different stakeholders involved.

The purpose of this project was to identify the issues for current state and practice of thermal energy sub-metering in multi-unit residential buildings from an affordability and equity perspective. The following research questions guided the project:

- What are the current business practices of third-party sub-metering services for thermal energy in multi-unit residential building in the Vancouver area? What does the suite-level thermal energy sub-metering billing process look like and how are the bills reconciled with building-level thermal energy bills?
- What are the benefits/drawbacks of thermal energy sub-metering in suite-level billing for different stakeholder groups?
- What are the perspectives of different stakeholder groups involved in thermal energy sub-metering in the Vancouver area?

This report was completed as part of the Greenest City Scholar program between the University of British Columbia and the City of Vancouver.

Background

Buildings in Vancouver make up over 50% of the City's carbon emissions by using non-renewable energy resources such as natural gas for space heating and hot water. In the Climate Emergency Action Plan (CEAP), the carbon pollution from new buildings is expected to be half by 2030 from 2007 levels (City of Vancouver, 2020). The City of Vancouver is radically decreasing energy use and transitioning from fossil fuels to renewable sources with a focus on better building construction and operation and is committed to implementing such policies equitably.

Decarbonizing Vancouver's new and existing building stock in many cases includes a transition to low carbon high-efficiency centralized heating systems (i.e. heat pumps). In centralized low carbon systems at the neighbourhood scale, a master thermal energy meter is typically installed at the interface between district utility and building to measure the supplied thermal energy. In addition to the centralized meter, the building owner and property manager may choose to introduce third-party sub-metering services in each unit to directly recover the costs associated

with suite-level thermal energy consumption by residents. Energy sub-metering and suite-level billing are generally understood to be effective tools in reducing thermal energy consumption by allowing consumers to see their energy usage and associated costs, giving them the ability to modify their behavior if desired.

However, the practice of thermal energy sub-metering in British Columbia operates in a unregulated space. Without a set of rules designed for measurement, rate setting and billing of thermal energy used by end consumers in multi-residential buildings (condominiums, apartments, office or retail units), it is unclear whether costs are allocated effectively or fairly. This may result in high maintenance cost for operator, increased end-user consumption (energy waste), or unfair bills to end-users. The issue is more noticeable when the third-party submetering companies get involved. Such service providers operate in an unregulated space where rate setting and billing practices are often opaque, which may leave some groups of residents vulnerable to unfair business practices for thermal energy which is an essential service. The lack of transparency and inconsistency in implementation raises significant concerns among stakeholders and limits the application of thermal energy sub-metering.

Methodology

The study was conducted using qualitative research methods, including literature review, external interviews with stakeholders and a high-level analysis of utility bills from residents. For literature review, a comprehensive scan of existing regulations of different jurisdictions, communication materials by district energy utility providers were made. Interviews with energy experts, district thermal energy utility operators, building developers, building managers/operators, sub-metering providers, and customers were conducted to identify the benefits and drawbacks of suite-level sub-metering systems and service. Lastly, actual utility bills from several customers of thermal energy sub-metering companies were reviewed.

Findings

A summary of findings from the study is provided here:

- District Energy Utilities like the City' Neighbourhood Energy Utility (NEU) can set thermal energy rate in the sale of energy to the building owner or operator, however they have no control over suite-level energy bills being paid by residents. This creates space for developers, operators, third-party sub-metering providers to administer suite-level metering systems and charge end-users arbitrary rates with little transparency.
- Typically, a third-party sub-metering agreement in a building is set up before the occupancy of strata owner and rental tenants. Due to poor communication between developers, building operators and residents, most end-users are not aware that they have sub-metered energy bills to pay. The lack of transparency in communication has a negative impact on the acceptance of sub-metering service.

- The energy rates charged by third-party sub-metering companies for thermal energy are not regulated by any jurisdiction in BC. When a third-party sub-metering provider is involved, an additional layer of cost is placed in the billing and cost allocation process in suite-level sub-metering, which incur more charges to end-users.
- The fixed costs levied by a thermal energy utility typically contributes to a large portion of both the energy bill and the sub-metering bill, and is independent of the overall energy consumption by end-users. This high fixed cost sometimes discourages end-users from reducing thermal energy and hot water consumption; thus it is difficult to achieve overall energy conservation goals.
- One cost allocation method which building operators and third-party sub-metering provider commonly use to pass on utility cost has a big impact on fairness. In this method, the third-party sub-metering provider charges the end-user their portion of the fixed costs based on the suite's monthly consumption. This means that empty suites or suites with low consumption are not being billed for their share of the fixed utility costs even as they benefit from the availability of the energy system. The fixed cost portion of a building's utility bill should be equally distributed to all suites but is either absorbed by building operator or being passed on to end-users based on in-suite energy consumption.
- Sub-metering bills reviewed in this study lack transparency and should correctly and clearly showing the energy rates, usage amount, explanation of the charges, and other information which can help end-users to understand their energy consumption and costs.

Recommendations

Recommendations have been classified based on the roles the City can play in helping the public and industry understand thermal energy sub-metering arrangement and the issues brought by third-party implementation.

In the role of convener:

1. The NEU and City of Vancouver can take the lead on regulatory improvement by enacting policies to regulate third-party sub-metering arrangement within NEU service area, including rate setting, billing and invoicing.
 - The fixed utility charges from the NEU are best recovered through the buildings strata fees or rent. Only the variable portion of the charges should be flowed through to the suite-level consumer to provide consumers with the ability to control their thermal energy consumption to reduce energy costs, if desired. Policy changes can enable this.
2. The NEU and the City can convene a platform or network to gather developers, building operators, strata owners, end-user and sub-metering companies to support the sub-

metering regulation, implementation and research, and ask for the accountability of different stakeholders.

In the role of broker:

1. The NEU and City can improve education and outreach to residents to help them better understand both building-level and suite-level sub-metering .
2. The NEU and City undertake research to identify further inconsistencies between building-level and suite-level metering data.

In the role of steward:

1. The NEU and City can advocate the need for greater customer protection to BCUC and other levels of governments as appropriate.
2. The NEU and City can utilize City resources to expand the study on the issues relating to suite-level sub-metering (e.g., collect more data from sub-metering bills, analyze energy consumption data from sub-metering companies, expand the interview/survey group).

Conclusion

This project studied the third-party submetering arrangement and identified its advantages and drawbacks. This study focused on existing NEU connected buildings and several buildings not within the NEU service area were included for a broader understanding of the submetering practice in the Vancouver area. The regulatory environment was investigated through literature review. Issues with the lack of fairness and transparency with third-party thermal energy sub-metering were identified-through interviews with stakeholders and by analysis of sample sub-metering bills. Recommendations were made for the City and stakeholders to increase the accountability and optimize the transparency for third-party sub-metering arrangement.