Chapter 10

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ABSTRACT
Companies around the world are increasingly expected to report their greenhouse gas emissions. Currently there are various formulas to calculate emissions, and there are different reporting formats. Most of the reporting formats are paper-based or non-readable-by-machine formats. The emissions of companies will influence their accounting results due to ‘cap & trade’ systems or environmental taxes. Analyses of financial impacts are important for management decisions and corporate evaluations by interested third parties. A standardized reporting format for GHG (greenhouse gas) emissions is critical for reliable analysis of the impact of emissions on finances. This paper proposes an XBRL (eXtensible Business Markup Language) format as the foundation for standardizing the emissions reporting formats, and provides a preliminary XBRL taxonomy for emissions reporting. XBRL makes it possible to combine the financial reports and the emissions reports. Evaluations of the emissions impact are easier for both managers of the company and external parties, even if a large number of emissions reports must be analyzed.

INTRODUCTION
Global warming is a critical environmental issue for sustainable economies. International efforts are increasingly necessary to increase the number of sustainable countries. GHG (greenhouse gas) cap & trade policies are being adopted in many parts of the globe (Chicago Climate Exchange, 2007; European Commission Climate Action., 2005; Regional Greenhouse Gas Initiative, 2008; The Climate Registry, 2009; Western Climate Initiative, 2010; CRC Energy Efficiency Scheme, 2009; Climate Change Information, 2008; Department of Climate Change and Energy Efficiency, 2007).
In Japan, the government requires GHG reporting about company emissions, but the emissions trading schemes are still experimental programs (J-VETS, 2005; Ministry of the Environment, 2008). Domestic and international ‘cap & trade’ schemes are becoming important to meet the reduction targets for GHG emissions. Therefore, we believe that GHG emissions from companies will ultimately be capped, not just for large companies but even for small and medium-sized companies.

If companies’ emissions are legally capped, emissions allowances will be a management resource similar to capital or human resources, and emissions results will have an impact on the financial results of companies because of the costs of emissions trading or environmental taxes. The analysts and interested parties will evaluate companies including their emissions controls. We believe that the emissions data from companies may have large impacts on their financial results.

Currently, most of the formats used for emissions reporting are paper-based, as prepared by spreadsheets such as MS Excel or from PDF files. Since 2009, all Japanese corporate financial statements must use an XBRL (XBRL International, 1999) format. Therefore, disclosing the emissions data by using XBRL will be very beneficial for the analysis of the financial positions and emissions results of these companies. Interested third parties will want to combine the XBRL reports of the financial data and the emissions data. This will allow them to easily evaluate the companies from both the financial and environmental perspectives. Large numbers of analyses of emissions reports will be required when companies disclose their emissions data. In response to these needs, we are studying the requirements of a standardized data format for GHG reporting, proposing reliable XBRL emissions reporting, and showing its advantages.

This research paper is organized as follows. First, we explain the background of this work. Several current metrics of companies used for environmental evaluations are reviewed. Then we discuss prior literature on emissions trading and environmental accounting, and review the problems of current emissions reporting that motivate our work. Based on these discussions, we propose XBRL-based emissions reporting and describe XBRL taxonomy for emissions reporting. We also present an empirical analysis of the usefulness of an evaluation using the combined financial and emissions report. Finally, we summarize our conclusions.

**BACKGROUND**

The use of domestic and international ‘cap & trade’ schemes will become more important to achieve ambitious reduction targets. Even small companies may be capped, not just large companies. When companies’ emissions are capped, emissions results will influence the financial results of the companies, and we present some examples. A company may need to buy emissions allowances if its emissions are exceeding the targets. The expenses for emissions trading will affect the company’s profits. New environmental taxes have also been discussed around the world, and these taxes will be imposed according to the emissions results. The profits of companies will be influences in various ways by the emissions results.

We also believe that these results will become one of the important metrics for management decisions, similar to ROE and ROA. There are already some indices for corporate evaluations of emissions. The CDP (Carbon Disclosure Project, 2009) provides the disclosure of greenhouse gas emissions and climate change data of companies worldwide. They define a metric called the CDLI (Carbon Disclosure Leadership Index) (Carbon Disclosure Project, 2010) for companies based on a set of criteria in their CDLI scoring system. This assesses the quality of the disclosures across industry sectors. Currently, this may be one of the most widely used indices, though the methodology has not been fully disclosed. Another emissions-
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