

# The need to adapt emerging sustainability audits to atypical business models

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## Abstract

The transition to sustainability requires new business models that aim to achieve triple bottom line benefits, while utilizing appropriate technologies and new knowledge platforms for doing business. Around the world, the concept of “Third Places” has emerged as a powerful business model consisting of a mix between a coworking space and a production facility. Third Places tend to be structurally more complex (having multiple firms co-located in one facility) and but they are also more flexible. In this commentary, we discuss the challenges of implementing a sustainability audit tool to the emerging business model of Third Places in order to measure their performance, which we exemplify with a specific application to “The Plant” located in Chicago.

## Manuscript

## Introduction

### *Third places*

New business models are now springing up around the world that are much more versatile than traditional businesses in terms of values orientation, organizational structures and the delineation between customers, employees and stakeholders. Focusing specifically on emerging sustainable business models, Bocken et al. (2014) describe eight archetypes that fall under three dominant themes: (1) technological or more environmentally-oriented models include adoption of core business strategies and practices around maximization of resource efficiency, value creation from waste, and utilization of renewable inputs and processes; (2) social oriented business models include servicizing—delivery of a function or service rather production, social responsibility or stewardship such as fair trade, and encouraging sufficiency in consumer behavior; (3) organizational-focused sustainable models emphasize business models that redefine the purpose of business as achieving social and/or environmental benefits above or on equal footing with profitability, such as through social enterprises and benefit corporations, and scale-up solutions meant to promote widespread adoption of novel businesses, such as through incubators and collaborative approaches. Emerging sustainable business models may incorporate one or more of these archetypes. Many of these emerging models, particularly those under the organizational theme also function as “Third Places”, a concept initiated to describe informal public gathering spaces, distinct from home and work, where individuals socialize and build community (Oldenburg

1997). Third Places tend to break away from the standard hierarchy of competence and responsibility adopted by most traditional businesses. Moreover, they tend to be innovative, and they are often based on sustainable and ethical values. Two examples of organizational-oriented sustainability business models that also incorporate elements of Third Places are *The Warehouse Darwin* in Bordeaux, France, and *The Plant* in Chicago, USA. Created as a start-up incubator, *The Warehouse Darwin* hosts a number of diverse activities from food service to shopping, including a cafe, an urban farm, and repair shops. The structure also hosts art exhibitions, sports events, and even aquatic activities. *The Plant* is a former meat-packing factory that has been repurposed as a hub for sustainable urban agriculture and food production with emphasis on the circular economy, business incubation and community education and engagement. Third Places also tend to be rooted in circular economy principles. While few would argue that these types of initiatives are inspiring because of their sustainability aspirations, trying to concretely assess and measure their performance is far from trivial.

### *On measuring performance*

The traditional way to evaluate business performance, regardless of the category being measured, is based on auditing the business' activities, and its ability to produce or trade material or services and generate a profit. For example, a food production business would order materials, process them, and sell them to cover expenses make a profit. Audits provide a snapshot of an organization's current performance and relevant information that can be used to maintain and improve relevant activities. In general, audits can be performed to investigate performance along any selected category, including financial, food safety, quality, partnership-related, environmental, or even social. Audits can be pursued towards regulatory compliance, performance assessment, external certification or simply continuous improvement. Environmental audits typically begin with a quantification of the material and energy resources consumed by an organization, and the products and wastes generated, commonly referred to as a Material Flow Analysis (MFA).

Although there are numerous frameworks for measuring sustainability performance, none of these are universally accepted or applied. Coyne (2006) partially addressed the issue for the business world, discussing elements of social responsibility. Moreover, Soyka (2014) summarized multiple discussions and events addressing the need for corporations to measure and improve their sustainability. Commonly used sustainability-oriented auditing and reporting frameworks include: the Global Reporting Initiative (GRI, focused on triple bottom line accounting), CDP (formerly Carbon Disclosure Project, focused on greenhouse gas emissions), Leadership in Energy and Environmental Design (LEED, focused on building performance), and SA8000 (social accounting standard). The ISO 14000 family of standards, for example, emphasizes environmental management systems, with sub-standards focused on specific tools such as audits, communications, labeling and life cycle assessment, and specific issues such as climate change (ISO 2015).

While a sustainability audit is needed to improve businesses practices, they are often created by and geared towards larger entities. They are often too rigid and impractical for smaller and rapidly-changing entities with emerging business models and operating in Third Places. These different challenges were raised while working on the MFA analysis of *The Plant*, a Third Place located in Chicago, Illinois.

## Case Study

### *MFA approach of The Plant, Chicago*

In summer 2016, we set out to perform a sustainability audit of *The Plant* in order to measure and quantify the benefits of adopting this business model. *The Plant* is an old meat packing facility in the Back of the Yards neighborhood in Chicago that has been renovated to host multiple food and environmental-conscious businesses. The structure advocates for a circular economy by encouraging the sharing of material and knowledge resources across businesses within an industrial symbiosis framework. Activities include production of biomass from outdoor and indoor farming and food preparation such as brewing, baking or torrefaction. An onsite bio-digester is designed to create energy using waste biomass from the site and also from the city. Moreover, the staff of Plant Chicago (non-profit arm of the structure) is socially driven and aim to promote the concept of circular economy through education and community outreach. *The Plant* has become quite popular, getting media and public interest from around the world. It has been hailed as a desirable model that can be replicated to address sustainable food production, industrial building reuse and public engagement in an urban environment. It can also be considered as a Third Place as the dynamics between the different parties takes an inclusive approach, considering different interests of the owner of the building, private and public investors, the tenants, the non-profit organization, the visitors, the interns and volunteers. Each group bringing to the project their skills, time, money, creativity to make the project even more sustainable and circular. *The Plant's* strength lies in the very intense social interactions among the actors, which allow the overall system to progress in a very organic way.

We spent three months trying to map and measure the flows of energy and material among individual tenants across the facility, using a Material Flow Analysis (MFA) approach (Graedel and Allenby 1995), and analyzing electricity bills for energy use. For each tenant of the building, we created a Sankey diagram for the flows of materials for a three-month period (Chance et al. 2017). One example of these diagrams is shown on Figure 1, capturing the total material flows of the Pleasant House Bakery for three months. Water represents the largest material flow by mass for both inputs and outputs. While firewood for heating the ovens is the second biggest inflow. Bread and pies are the next largest material flows following water, and are the primary product output of Pleasant House Bakery's business. This business' special feature is the wide variety of materials going in and out, requiring a very strict tracking for the employees. The project enabled us to extract various material flows estimations, which can be used as indicators for the overall system performance and sustainability.

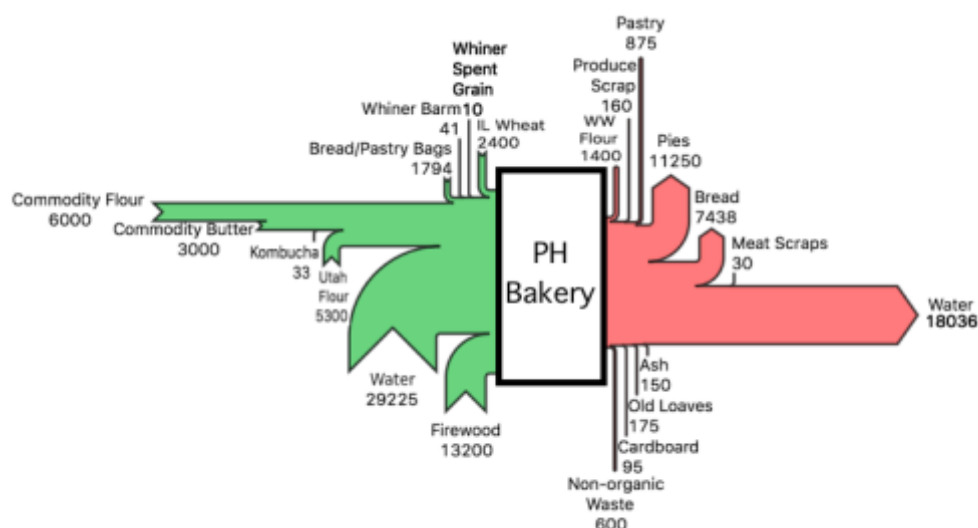


Figure 1: material flow diagram of Pleasant House Bakery, unit in pounds (1 lb ~ 0.45 kg) ) for the months of March to May 2016.

### *Challenges raised by the MFA*

Although the MFA analysis of the businesses in *The Plant* was valuable for the tenants and the owner of the building for revealing quantities of materials consumed, and the disposition of various categories of waste by different tenants, it quickly turned out to be a nearly impossible task. Most of the businesses located at *The Plant* are small, entrepreneurial, flexible, and they adapt their production to market needs as well as the seasons. These are desirable traits for a small business, but they do not align well with traditional MFA and audit methodology that favor consistent flows over time. In addition, most of these small and new businesses did not precisely track their input or output flows or they were unable to translate certain items into weight measurements. Another MFA protocol challenge was the collection of many flows of small quantities as opposed to few (important) material flows with large quantities, which are preferred to more easily quantify energy and material flows, although somewhat typical in urban farms (Martin, Clift, and Christie 2016). Moreover, because most businesses are seasonal, their energy consumptions can vary enormously by season, and then even by year since businesses may change the type of produce they grow, and their market might expand or shrink. As importantly, *The Plant* is a dynamic place, and businesses come and go. Getting a standard energy and material “snapshot” in a given year simply seems meaningless to compare data from one year to the other.

Another issue relates to the fact that social benefits were not captured using the MFA framework. This is also confirmed by Heinbach et al. (2014) who created a framework to measure the impact of renewable energies on local value added and employment, which are the main incentive for municipalities to get involved in the topic. John S. Mulrow et al. (2017) combined five types of capital flows: manufactured, natural, financial, social and human to create a framework useful for understanding facility-scale industrial symbiosis, which fits a third place organization and structure.

At this point, quantifying and measuring *knowledge* flows between businesses and the general population are not fully explored. To partially account for some of these considerations, Plant Chicago is recording several indicators, including the number of visitors for the tours, the number of people attending events and workshops, and the number of interns. These types of measures are referred to as “indicators for cultural service” by Mononen et al. (2016). As pictured in Figure 2, *The Plant* could further measure these indicators among businesses, and count the number of hours spent on consulting/advising others by the businesses, and the number of people benefiting from this consulting. Furthermore, some of the work of Plant Chicago often overlaps with many of the businesses at *The Plant*. For example, Plant Chicago’s interns often work for businesses as well.

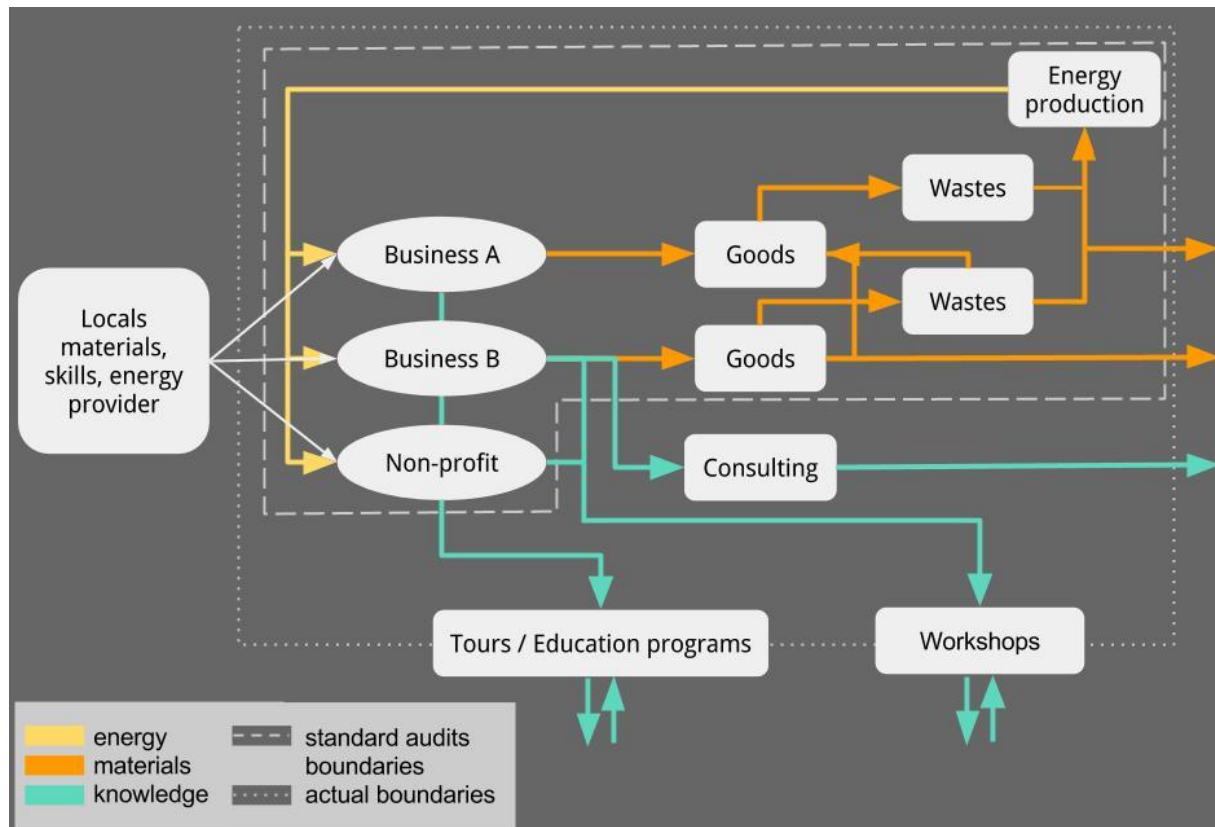


Figure 2 : Differences in system boundaries between what would be considered by traditional audits at The Plant and the complexity of the actual system.

When comparing both abstract cultural services such as knowledge with market-valuable gains and exchanges, a challenge is to be able to compare on a similar scale. This is further complicated that an effective protocol should be applicable to any type of facilities. Also, the Foundation Center summarizes over 150 tools and resources for assessing social impact. It may be interesting to combine these tools with an MFA approach and to fully quantitatively audit an innovative structure such as *The Plant*. At a more technical level, new standards should also include details on how to manage and store the data collected (e.g., data management plan), so that audits can be performed more frequently and more easily.

A study done by Mamede and Gomes (2014) on corporate sustainability measurement in service organizations had brought forward similar conclusions; the survey especially showed that the easiest way to acquire information is to collect it from the organizational accounting information system that includes traditional data such as invoices, employee demographics, and salaries. In our study, monetary information was not collected but it is considered as a possibility for further research. In addition to these significant issues, we also had trouble managing the data we were collecting at such a small scale; traditional relational databases are not flexible and storing the data in Microsoft Excel or Google Spreadsheet was not convenient because of the large variety of data categories and absent data in each. Even if we were able to fully audit *The Plant*, it became evident that any effort to reproduce the audit in a similar way in the future would not give us comparable results as companies, products and material flows will change over time, and therefore adequately tracking the evolution of the facility using current auditing standards was simply impossible.

New auditing protocols should be easily applicable, so that even small businesses can conduct audits regularly and thus monitor their progress on relevant parameters. They should also be more flexible. For example, they may focus mainly on large flows of energy and materials such as electricity and water consumption that are easily metered, and from which



we can extract a figure in grams of CO<sub>2</sub> emissions. Emissions from transportation activity could also be estimated. A scope system may also be beneficiary, similar to the way greenhouse gas emissions are quantified for companies and cities (Wee Kean Fong et al. 2014), in which scope 1 accounts for all emissions from sources within the entity, scope 2 accounts for all grid-supplied emissions consumed (e.g., electricity, heat, steam, cooling water), and scope 3 accounts for all emissions from goods produced anywhere in the world but consumed in the city. Moreover, a second type of metric should also be added to acknowledge efforts made to be more environmentally conscious and socially oriented, whether in the form of a score, a color, or a credit. In fact, some of these activities currently appear as an environmental cost, for instance by requiring electricity during an event, whereas they may produce long-term educational and cultural benefits.

## Outlook

In short, new auditing protocols should reward flexibility and adaptability, and favor new and sustainability-driven practices. We need to incorporate different measures like social, environmental, cultural or knowledge capital to measure the performance of places like The Plant in Chicago and The Warehouse Darwin in Bordeaux, and thus encourage new businesses to follow similar practices.

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