Energy Reduction Through a Deeper Understanding of Household Consumption

Staying Cool in Metro Manila

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Summary

This article proposes a multidisciplinary and systemic approach to sustainable consumption that combines environmental considerations of energy usage from a life cycle perspective with a social understanding of consumption grounded in economic anthropology. The goal is to understand both consumption patterns and drivers, with a focus on household energy used for cooling in the metropolitan region of Manila in the Philippines. For different socioeconomic groups, cooling devices also deliver social and cultural services, such as socializing or adhering to Western fashion trends. This article argues for the need to address these aspects if reductions in household energy usage are to become possible. The limits of individual-choice theories are rendered apparent, with examples of how institutional and structural conditions lock in consumption patterns and restrict household choices. The notion that emerging economies might be able to "leapfrog" over the environmental errors of more industrialized countries is also raised and critiqued.

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Introduction

Sustainable consumption research and policy making is a central but relatively recent contribution to the area of society and environmental interactions. One of its main challenges is to understand how more people can achieve higher standards of living while more equitably sharing the global resource pie, reducing energy and material usage, and avoiding resource depletion as well as local and global pollution. Yet today, certain emerging economies are following the resource-intensive development path of more industrialized countries, experiencing what Rostow (1960) called—in his influential and controversial U.S.-centric framework on economic growth—"a widespread boom in consumers' goods and services" along with "the acceptance and absorption of the age of high mass-consumption" (88).

Mass consumption is often driven by a rise in affluence. For Myers and Kent (2004), Asia is the center of gravity for this "new consumer" phenomenon, where a rise in affluence often translates to consumers who enjoy a better diet, private transport, throwaway products, and fashionable versus functional clothing. One hopes that these emerging economies might yet choose sustainable modes of economic development that would allow them to transcend the errors of more industrialized countries and thus "leapfrog" over environmental degradation (Chiu and Yong 2004; Tukker 2005). Opportunities for leapfrogging are not clear, however: To understand how transitions to more sustainable lifestyles could be made possible, we need a deeper understanding of consumption drivers in developing countries, with a consideration of socioeconomic differences among consumer groups.

This article focuses on energy consumption in the context of an urban megalopolis in a Southeast Asian emerging economy—Metro Manila, or the National Capital Region of the Philippines (among Myers and Kent's [2004] 20 new consumer countries). The focus is on cooling services, including fans and air conditioning. This article contributes to social and cultural research on household energy consumption in developing countries (Wilhite et al. 1996; Bank 1997; Mehlwana 1997; Lee 2006) and research on energy in the Philippines more generally (Sathaye and Tyler 1991; Garcia et al. 1994; Bensel and Remedios 1995; Tyler 1996). It also builds on studies that consider air-conditioning uptake and usage as socially and technically constructed and as tied to notions of comfort and the human body that have become increasingly global in reach (Cooper 1998; Shove 2003; Chappells and Shove 2005; Parkhurst and Parnaby 2008; Wilhite 2008).

The main goal of this article is to demonstrate how a deeper understanding of household electricity usage can lead to reduced energy consumption. Two main questions are addressed: What energy consumption patterns are developing at the household level, in particular with regard to electricity usage in the home? And what are the drivers behind those patterns, in light of research on consumer practices? As developed in the work of Bourdieu (1972), practices—which inevitably involve the use of material resources—go beyond the structure-actor dichotomy in sociology. They can be seen as a constellation of actions that become the units of analysis for understanding social life (Randles and Warde 2006; Røpke 2009; Shove et al. 2009).

In a first section, this article sets the stage by presenting a brief conceptual framework. The next section is an introduction to the context of Metro Manila and the three neighborhoods of the study, as well as the historical, international, and local context of energy use in Manila and the Philippines. The methodology is then presented, followed by the research results. The article concludes with a discussion on the research findings and policy recommendations.

Conceptual Framework of Consumption

Addressing consumption is very much akin to opening a social science Pandora's box of complexity, because of all of the diverse issues and perspectives it raises. This article takes a multidisciplinary and systemic approach to consumption. On the one hand, energy usage patterns and priorities for reducing household electricity consumption are determined on the basis of a life-cycle perspective to provide an environmentally

relevant context. On the other hand, the drivers behind those biophysical patterns are based on a social understanding of consumption. Because no single theory can be applied to understanding all forms of consumption, we have chosen to build on Wilk's (2002) "heterodox multigenic" conceptual framework, which proposes three complementary consumption paradigms—social, cultural, and individual choice—which can, in turn, lead to multistranded policy solutions.

Social forms of consumption involve collective actions and group pressure, or consumption as a form of social belonging (e.g., Bourdieu 1979; Veblen 1994/1899). Cultural forms of consumption consider the symbolic value of products, as objects for display and communication (e.g., Baudrillard 1970; Douglas and Isherwood 1979). The individual-choice approach involves consumers making decisions on the basis of a hierarchy of needs and in a marketplace of opportunities, rationalizing purchases on the basis of information and price. Despite the vast amount of work that has been opposed to this perspective (starting with Karl Polanyi 1957, 2001/1944), the individual-choice approach remains prevalent and pervasive in sustainable consumption policy making today, as the flurry of information campaigns and ecological taxation schemes worldwide might suggest. Without a social and cultural understanding of consumption, this paradigm remains limited in its ability to understand all consumption drivers (Cohen et al. 2001).

The Context of Metro Manila

Three Neighborhoods

Metro Manila is said to have two seasons: the hot season and the even hotter season, with temperatures ranging between 30°C and 37°C throughout the year. With a population of approximately 12 million people, high wealth coexists with a growing middle class and many who live on less than a dollar per day; infrastructure is in different phases of development across the 17 cities and districts that make up the national capital region. Metro Manila also experiences an urban heat island effect, with higher temperatures relative to surrounding areas because of its high population density, built environment (asphalt and concrete, which tend to store heat), and other factors, including the use of motorized vehicles and air-conditioning units. Under adverse conditions, such as weak winds in the summer, the city temperature can be up to 10°C warmer than surrounding rural areas (Estoque and Maria 2000).

The first neighborhood selected for this article is in the Tondo district and is best known as Smokey Mountain, the name of an infamous landfill that was active for 40 years and was closed in the 1990s. At that time, several low-income buildings were constructed to house the squatter community. Ironically called Paradise Heights, this neighborhood includes several five-story buildings housing approximately 20,000 families in total. Within the compound, few livelihood opportunities exist, and many families continue to generate revenue from the collection, sorting, and resale of recyclables, facilitated by access to the piers that serve as waste dumps and areas for exporting recyclables to China. Each apartment unit is similar in format: The total floor surface area is 6×3 meters, with a main area, including kitchenette and toilet, and a narrow staircase leading to a loft used mostly for sleeping at night.

The second neighborhood selected is Malate, a more middle-class area. One mark of a middle class family is that they have a maid and perhaps even a driver. These domestic helpers often come from the provinces and live in the household of their employer. In the best-case scenario, they have their own room; in some cases, they sleep in the kitchen, under the table or on a rolled-up mattress. On the Manila Bay, this neighborhood benefits from many bars, restaurants, and shopping malls. When sociologist Jean Baudrillard described commercial centers in 1970s France, he might not have imagined the scale of Manila's shopping centers today, including the Mall of Asia, with its gross floor area of 410,000 square meters, not far from Malate. These facilities are a primary weekend destination for Filipino families, who use the verb "to go malling." Many people say they visit malls not for shopping but for the cool and free air-conditioned spaces.

The third area studied is the City of Makati, which represents the higher socioeconomic

groups. Makati resembles any other financial district in the world, with its skyscrapers, bustling streets, and five-star hotels. Makati is different from city centers in the West not only in terms of its size: In the heart of the city, several gated communities encompass the guarded villas, apartments, and gardens of Manila's wealthiest inhabitants. Domestic helpers and air conditioning are the norm rather than luxuries in these housing developments, which have followed a pattern of new technology adoption similar to that in the United States, where air conditioning was successfully integrated into building design, construction, and financing during the postwar period (Cooper 1998). The housing structures of Makati's Dasmariñas Village, for example, included built-in air-conditioning when designed in the 1960s. Although income levels in certain Malate and Makati households may be similar, large inequalities persist between households in Tondo and Makati. The use of the term "socioeconomic groups" in this article includes factors such as education, diet, and housing type, and location, in addition to income.

This analysis also considers a group of people known in the Philippines as overseas Filipino workers (OFWs), who best fit the description of "new consumers." More than 2 million Filipinos work overseas at any given time, often leaving behind their families to seek livelihood opportunities abroad (approximately one third of OFWs were laborers and unskilled workers in 2008, including domestic helpers and cleaners; NSO 2008). Migration is an important livelihood strategy in the Philippines and is visibly encouraged by the government (Quisumbing and McNiven 2010). The OFWs are seen as particularly important for the national economy, contributing more than 10% of gross domestic product (GDP) and sending remittances that support extended families by offsetting household expenses in areas ranging from housing construction to education (IBON 2008a).

Environmental Context: Energy, Electricity, and Carbon Dioxide in the Philippines

In this section, energy use and carbon dioxide (CO_2) emissions of the Philippines are described, with an emphasis on electricity and household usage. We include data from the last few decades and put the results in an international context, including recent results on trade-linked emissions. Because the Republic of the Philippines is an archipelago, we pay special attention to the electricity production of the local grid for Metro Manila.

Since 1950, the Philippines has experienced growth in every possible dimension: The population has increased almost fivefold, the economy has grown more than twelvefold, and the emission of CO_2 from fossil sources has increased by a factor of 20 (figure 1). This growth corresponds to increases in affluence, industrialization, and development, which are still ongoing.

One sign of development is a slowing in population growth rates: These have fallen from 3% a year in 1950 to 1.9% in 2005. The Filipino Human Development Index (HDI) grew from 0.66 to 0.77 between 1975 and 2005 and is now just below the threshold of 0.8 for "high human development" according to the United Nations Development Programme (UNDP 2007). Since 1950, GDP per capita has grown by a factor of almost 3, to US$2,895 per capita.

The emission of CO_2 has increased even faster than population and income. This escalation is typical of a phase of rapid industrialization, when a country's economy uses resources to build up its infrastructure, and should be put in an international context: Per capita, the Philippines was still at only 0.9 tons of CO_2 in 2005—a factor of 10 below most European countries, and a factor of 20 below the United States and Australia. Emissions accounting can be done from a production (territorial) perspective or a consumption (economic) perspective. The consumption perspective includes emissions caused by imports and subtracts those tied to exports, using multiregional input-output (MRIO) analysis. Peters and Hertwich (2008) conducted the first global analysis of trade emissions and found that the Philippines is a net importer of emissions. In 2001, on the basis of their analysis, the consumption perspective emissions per capita were 1.2 tons per capita.

As can be seen in figure 2, since 1975, there has been a moderate increase in primary energy use per capita (34%) and fossil CO_2 emissions

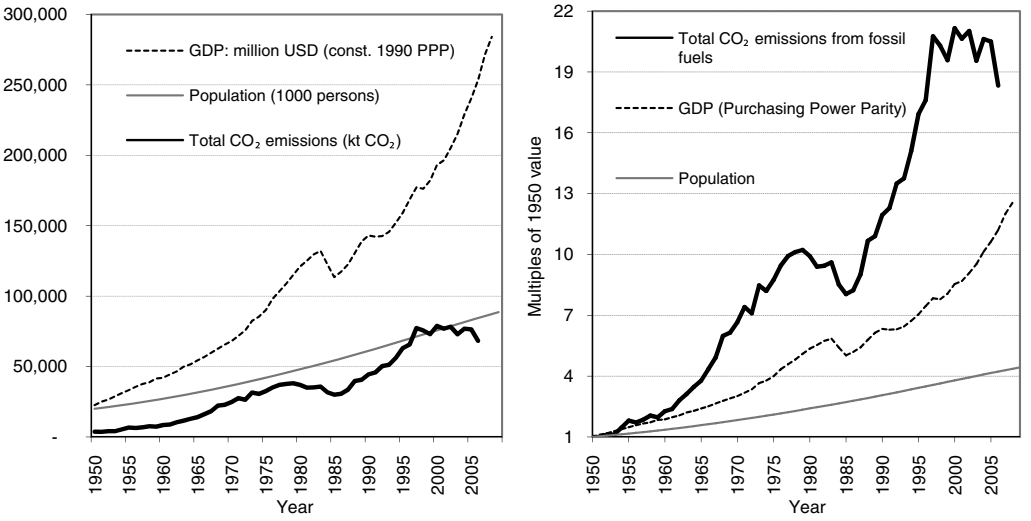

Figure 1 Population, gross domestic product (GDP) in purchasing power parity (PPP) at constant 1990 US dollars (USD), and carbon dioxide emissions in kiloton (kt CO_2) of the Philippines, total and indexed to their 1950 values (data sources: UN 2007; Boden et al. 2009; Conference Board 2009).

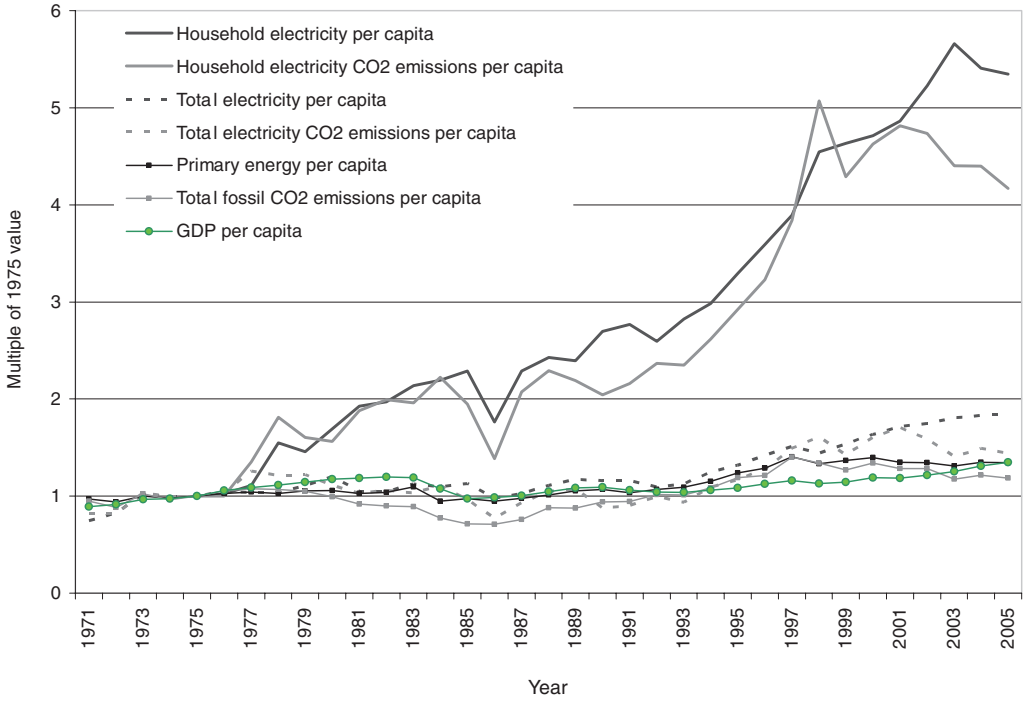

Figure 2 Energy use, carbon dioxide (CO_2) emissions, and gross domestic product (GDP) per capita, indexed to their 1975 value. (data sources: International Energy Agency 2007; UN 2007; Boden et al. 2009; Conference Board 2009).

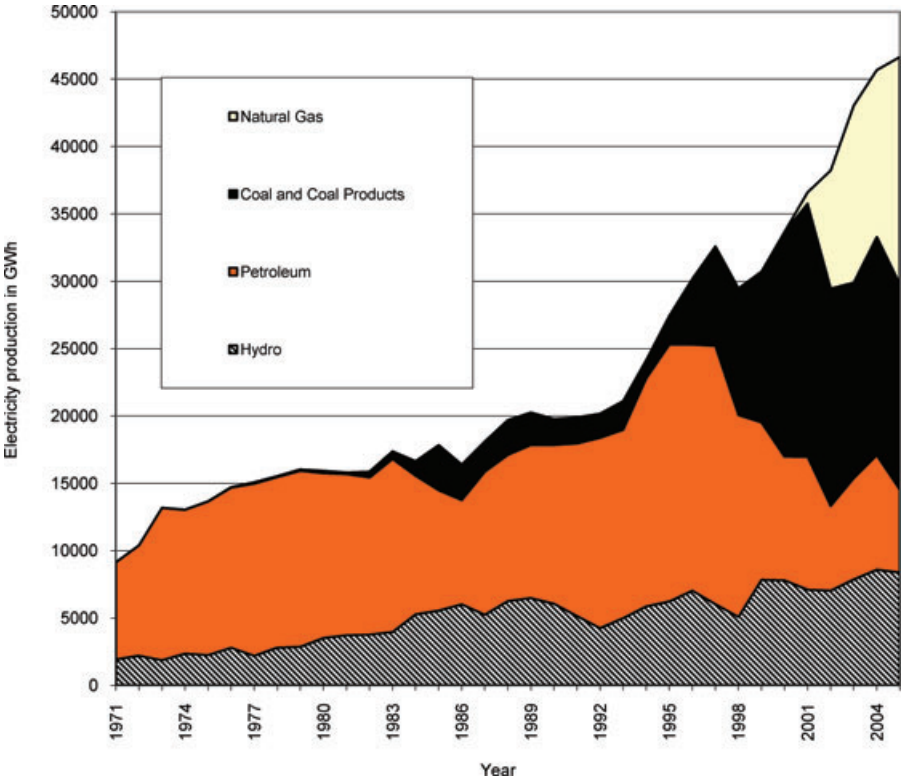

Figure 3 Electricity production mix in the Philippines (data source: NSO/DOE 2004). GWh = gigawatt hour.

per capita (19%), whereas GDP per capita grew by 35%. According to the International Energy Agency (2007), the energy demand of the commercial sector is also growing, perhaps due to an increase in the number of call centers and small-scale businesses. In terms of energy types, electricity grew at more than twice the rate of overall energy and experienced a per capita increase of 85% since 1975. The CO_2 emissions associated with electricity were not commensurate, given that they only increased by 43%. Indeed, in the short span between 1998 and 2005, the Philippines reduced the CO_2 intensity of the country's electricity from 0.75 to 0.52 kilograms of CO_2 per kilowatt hour (kg CO_2/kWh) by reducing the contribution of petroleum and adding natural gas for electricity production (figure 3).

The most striking feature in figure 2 is the extraordinary increase in household electricity use and associated CO_2 emissions. They have both increased severalfold: by a factor of more than 4 for CO_2 emissions and more than 5 for electricity. In 2005, household electricity accounted for a third of total electricity consumption in the Philippines and for 14% of the total primary energy supply—up from 12% of total electricity and 2% of the total energy supply in 1975. In 1975, household electricity consumption was responsible for a mere 3% of total CO_2 emissions: Thirty years later, this had increased to 11%. Clearly, household electricity is one of the most dynamic energy consumption components in the Philippines—and, most likely, in other industrializing (and many industrialized) countries.

At the national level, on the basis of the 2004 Household Energy Consumption Survey with data collected among 17 million households nationwide, 88% of all households rely on electricity as a major source of energy, an increase

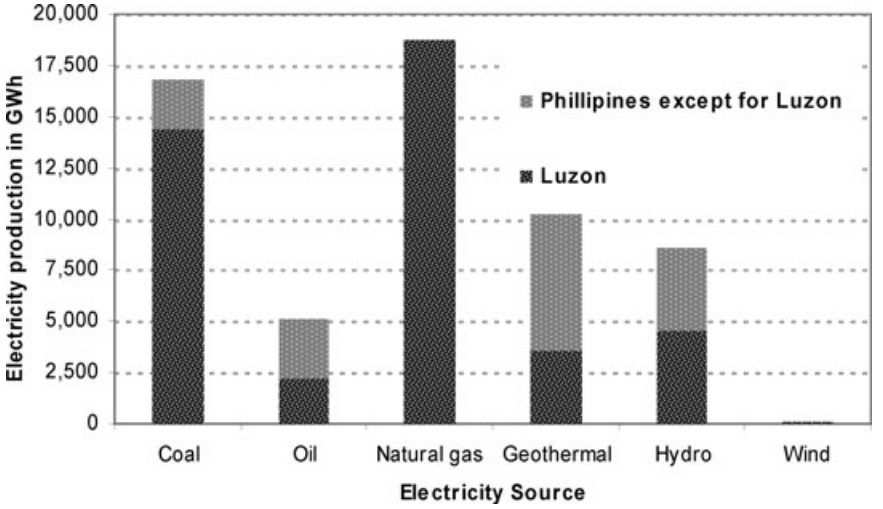

Figure 4 Power generation during 2007 by grid and source in gigawatt hours (GWh): Luzon and rest of the Philippines (data source: Republic of the Philippines 2007).

of 3.7% between 1995 and 2004 (SSC-CDM-PDD 2009). Geographically, Manila is situated on Luzon, the northernmost group of islands in the Philippines. For Luzon in 2007, electricity sales went up 3.0%, despite high electricity tariffs, whereas usage grew in the commercial sector by 6.0% and in the industrial sector by 4.0% (Republic of the Philippines 2007). Electricity consumption continues to rise, despite rising utility costs since the 1970s (Garcia et al. 1994). The cost of electricity in the Philippines remains among the highest in Asia (IBON 2008b).

Manila draws electricity from the Luzon energy grid, which is more dependent on coal and natural gas than other parts of the country (figure 4). In 2007, coal-fired plants accounted for the largest share of installed national capacity, contributing 4,213 megawatts (MW), or 26.44% of the total national mix. In Luzon in 2007, coal-powered energy represented 33% of power generation (Republic of the Philippines 2007). The Philippines relies on imports for most of its coal, primarily from Indonesia, China, and Australia (Republic of the Philippines 2010). Wind represents the largest potential for development in terms of renewable energy, with wind farms in northern Luzon generating 57,842 MWh, or 97.8% of the national wind energy total; wind farms currently meet only 0.13% of Luzon demand (Republic of the Philippines 2007). In terms of understanding the rate of carbon emissions in Metro Manila, recent reports developed under the Kyoto Protocol's Clean Development Mechanism for waste-to-energy projects in Metro Manila refer to an emission factor of 0.557 kilograms CO_2 equivalent per kilowatt hour (kg CO_2e/kWh) for the Manila grid (NSO/DOE 2004), a bit higher than the Filipino average of 0.523 kg CO_2/kWh.

As can be seen in table 1, the use of cooling is of interest because of its high rate of electricity consumption, particularly for air conditioning. Among households, electric fan usage is pervasive but uses less energy than air conditioning (fans, radios, and irons were found to be the most widely owned appliances in an earlier study of household energy patterns in Cebu City, the second city of

Table 1 National household energy consumption for cooling (source: NSO/DOE 2004)

	Annual consumption	
Cooling method	*in %*	*in kWh*
Electric fan	99.4	296
Air conditioning	8.8	3,914

Note: Cooling total annual consumption was 66.6% of all households nationwide.

the Philippines; see Bensel and Remedios 1995). No data are available for the breakdown of consumption by appliance for Metro Manila households, but higher incomes in Manila most likely lead to a higher diffusion of cooling devices and other household appliances than the nationwide average.

Methodology

This research relies principally on qualitative social science methods; quantitative information on energy consumption and CO_2 trends in the Philippines provide an environmentally relevant context. The qualitative research is used to identify consumption drivers, with insights into their relative importance depending on socioeconomic group. The research material was gathered through 34 semistructured interviews, conducted primarily in 2008. Previous visits in 2005–2007 guided the research design. The focus was placed on understanding consumer practices and perceptions in relation to energy consumption in general and electricity usage and cooling more specifically. Observations—in both public and private spaces, during the day and at night—were a key part of the research and helped to distinguish between what people actually do and what they say they do.

Observations were combined with semistructured interviews that took place in the households of the three socioeconomically distinct neighborhoods described above. Efforts were made to interview men and women of varying age groups, education levels, income, diets, and housing types and sizes (with consideration given to the presence of domestic workers). In the Tondo's Smokey Mountain buildings, the sample was skewed toward women, who were more responsive to being approached by a female interviewer. In the neighborhood of Malate, one apartment building and three single-family homes were selected for interviews and observations. In Makati, five single-family detached homes and two apartment units were included in the research design. In apartment buildings, we gathered the interview sample by knocking on every third door. Observations took place on social occasions in homes in all three areas.

We also used the field interviews to derive quantitative data on electricity consumption among selected households to illustrate the stark differences in consumption patterns across the various socioeconomic groups. The assessment of electricity use at the individual household level involved several challenges. The data include the type and number of appliances, along with self-reports of usage patterns: enough information to make a rough estimate of electricity consumption, but certainly not a precisely accurate one, given the variation in individual appliance consumption and frequency of use. In higher income households, household numbers encompass family members but also maids, drivers, and other domestic helpers, which raises the issue of how to calculate electricity usage per household member, as domestic helpers do not benefit from the many appliances used by family members. For example, air conditioning in bedrooms is often limited to family members only.

The focused nature of the fieldwork and interviews enables a deeper understanding of the multiplicity of issues surrounding household electricity use. This method is necessary to move beyond often-superficial statistical analyses (e.g., that resulting from general surveys) that can only produce correlations without causation. Although the in-depth nature of the interviews and fieldwork comes, of necessity, at the expense of statistical breadth, the insights these measures reveal could not be discovered any other way.

Research Results: Case Studies on Cooling in Three Different Socioeconomic Neighborhoods in Metro Manila

Household electricity consumption and cooling in particular are environmentally relevant in Manila, as we have seen above. In this section, we use qualitative methods to understand consumer practices and perceptions with respect to cooling, thus shedding light on the main drivers of consumption. The results are presented by socioeconomic neighborhood.

Fan Usage Among Select Tondo Households

In Paradise Heights, lifestyles differ among apartments: Most units benefit from electricity, very few use air-conditioning systems, and some have no electricity at all and instead use candles at night and purchase cooked food at nearby outdoor markets. The average income per household in this neighborhood is under 5,000 Philippine pesos (PHP) per month (US$100). Households range in size from one family with seven members to three families living together. We visited more than 20 units in Paradise Heights during fieldwork, and each unit had a fan and at least one light fixture; many also had a television and shared cell phone. In most of the households, at least one fan ran continuously day and night; other fans were turned on at night in the loft sleeping area. Respondents described a feeling of general comfort associated with fan usage, particularly for sleeping.

Unlike other interviewees in Malate and Makati, all research participants in Tondo were concerned about electricity prices and were able to give a very precise breakdown of household expenses. For example, one woman said that her seven-member family's monthly electricity bill was approximately 1,000 PHP, or 20% of their monthly expenses. At an average usage rate of 175 KWh/month, each household member consumed 25 KWh/month individually for three fans, three light bulbs, an iron, and a television set. In her unit, a nonfunctioning stereo system and two wall clocks were also on display (figure 5), along with toys. Electricity costs were reduced for another family once they removed their refrigerator. Most families buy food from outdoor market stalls directly below the buildings, storing almost no food items in the home (this moves fuel usage from the household to the commercial sector, as noted by Sathaye and Tyler [1991]). Another family acquired loans to pay off a particularly high month of electricity usage following the death of a family member: Christmas lights had been used to decorate a casket during a wake.

In terms of the fan product, respondents in Tondo households expressed no preference for the physical appearance of their fans and used whatever appliances were readily available and affordable on the market, almost always secondhand. Fans are not used as a means of display or for sharing cultural information (Douglas and Isherwood 1979), as opposed to the various items presented in figure 5. The fans have a practical purpose (broken fans are fixed or disposed of), and household members can be seen making energy consumption decisions that satisfy their personal need for circulating air, all the while taking into consideration cost sensitivity. As in Wilk's (2002) individual choice approach, energy consumption is seemingly motivated by individual and rational choice in this example: Household members are driven by an internal hierarchy of needs, including the need for comfort but also the need to save on household expenses. This remains a limited explanation, however, as we show in the discussion section that follows.

Air-Conditioning Usage Among Select Malate Households

Air conditioning in Malate homes is much more common, as are a whole host of other electronic appliances, including television sets, rice cookers, and stereos but also video games and karaoke machines. Air conditioning is often limited to nighttime usage in bedrooms only or sporadic living room usage for the arrival of guests or on particularly hot days. The service of cooling is therefore related to what can be called secondary social services, including socializing with guests or sleeping better at night. As one young woman explained,

> We don't have air conditioning in the salon and the dining area. We just have air conditioning in the bedroom. We usually go to the bedroom and watch TV and open the air conditioning . . . Like for fiestas, birthday parties, Christmas party, or family time, right after the lunch we congregate to the bedrooms, with everybody just hanging out in the bedroom and enjoying the air conditioning.

Air conditioning provides more than just a social and cooling service: It is also seen as a way of filtering outdoor noise and air pollution—that is, it offers the secondary service of perceived health and comfort benefits. One respondent explained

Figure 5 Electrical items on display, 2 October 2008, Tondo.

why she prefers closed windows and air conditioning usage to open windows:

> I'm living in an area where there are jeepney drivers, it's on the main road, and the jeepney drivers are very polluting. Because sometimes they park right in front of our home and leave the engines open, so that's why we always leave the windows closed.

Jeepney vehicles, converted American military jeeps that are a form of public transportation unique to the Philippines, are known for their bright decorations, inspired by both Roman Catholic and U.S. popular cultural icons, and for their contribution to Manila's heavy traffic and pollution.

The cost of air conditioning remains an important consideration; several respondents attested to cooling a closed sleeping area for only a short period of time or joining other family members in the same sleeping area to save on electricity bills. The monthly electricity bill of one respondent family of three from Malate was under 3,000 PHP, less than 1% of its monthly expenses. The household is also home for two live-in domestic workers, who share a room with no air conditioning and use a television set in the evenings. Beyond the maids' room, the household has two air-conditioning units that are seldom used, along with three fans, a refrigerator, two laptop computers, a stereo, and electrical cooking appliances. At an average usage rate of 312 KWh/month, the three main household members consume 104 KWh/month per person, or, if we include the domestic helpers, 62.4 KWh/month. This family is therefore spending a smaller percentage of its monthly expenses on electricity while using four times more energy per person than the Tondo household (see table 2). This particular family uses air conditioning very sparingly because of the household's proximity to the cooler air coming from Manila Bay and the possibility of opening several large windows for air circulation and cross ventilation.

The OFWs represent an important target audience for housing construction in the Philippines, where air conditioning plays a significant role, as explained by a real estate developer: "They even want to show the aircon jutting out of the window. *Diba* [know what I mean]?" He shared the image of a house used for promotional purposes: The air-conditioning unit was placed in a prominent position just in front of the house and below a main window, encased to

prevent theft (see figure 6). Large windows are designed to remain shut. Here, the air-conditioning product clearly serves a secondary service, that of display, in a way that communicates something about the owner through a cultural form of consumption whereby objects have a symbolic value (Baudrillard 1970; Douglas and Isherwood 1979). The air-conditioning unit also places the homeowner in a position of perceived strength in a form of social consumption, where consumers maintain and challenge social positions (Veblen 1994/1899).

Air-Conditioning Usage Among Select Makati Households

Although air conditioning remains a luxury for lower socioeconomic groups, it is perceived as the norm among the more affluent households of Makati, which enjoy the comfort service of indoor climate control (Shove 2003). An elderly woman remembered her first air-conditioning unit in the 1970s:

> We didn't want to spend the money. Then this friend bought it for us, she said that King [my husband] worked so hard, he deserved to have a good sleep. It was so that King could sleep in a more comfortable environment. And we had that one for a long time. But it was not that hot. Now, it's getting hotter, it's raining more. I don't know, something is wrong with the weather.

In the case described above, an "early adopter" instigated the couple to buy into the trend, an example of peer-to-peer persuasion (Gladwell 1997). Air-conditioning usage among this socioeconomic group is associated with the secondary comfort services of being able to work productively or to get a good night's rest. In other interviews, respondents also expressed their belief that air conditioning can filter out air pollution and therefore allows them to breathe healthier air.

People in higher socioeconomic groups may be increasing air-conditioning usage in winter months to follow Western fashion trends. At a social event in Makati in September 2008, the clothing style of some well-heeled guests led to a key observation: Despite the tropical outdoor

Table 2 Income, electricity consumption, and carbon dioxide (CO_2) emissions of selected households in 2008.

Research respondents by location	*Household members (including domestic helpers)*	*Family members*	*Monthly household income (PHP)*	*Monthly electricity consumption (kWh)*	*Annual CO_2 emissions from electricity (assuming 0.557 kg CO_2/kWh)*		
					Household total (tonnes)	*Per family member (tonnes/capita)*	*Including domestic helpers (tonnes/capita)*
Makati: male, 24–34 years old, completed graduate school or more	14	8	800,000	5,464	36.5	4.6	2.6
Malate: female, 45–54 years old, completed graduate school or more	5	3	300,000	312	2.09	0.70	0.42
Tondo: female,53 years old, high school graduate	7	7	5,000	175	1.17	0.17	0.17

Note: kg CO_2/kWh = kilograms carbon dioxide per kilowatt hour; PHP = Philippine pesos.

Figure 6 Promotional image for the Alicante house model. Photo used with permission granted by South Forbes (www.southforbes.com).

climate, one woman was wearing black tights and a woolen couture tailored suit, and another a cashmere dress. The large air-conditioning units were operating at full capacity but were encased in a wooden structure, which perhaps indicates that the product aspect or symbolic value of these units is not relevant to this particular socioeconomic group. Makati residents may not like the way these units look, but air conditioning allows them to dress according to fashion, a secondary service that underlines air conditioning as a social form of consumption. The cover of the 2008 Christmas issue of the *Philippine Tatler* illustrates the use of this secondary service: A couple dressed in sweaters poses in front of a roaring fireplace in their Metro Manila home (see figure 7). The clothes worn by certain people in the Philippines reflect northern hemisphere seasons. A fashion designer confirmed the observation by explaining what he wore to a wedding just before the "fall season" in Manila: "Although, when you think about it, autumn hasn't started yet. It will start in a few more days, September the 21st. That's why I was able to wear my linen suit." As another respondent put it, "I mean, you can only layer so much, and you can only be fashion forward in the summer collection, right? . . . You need seasons to be really fashion forward." Clothing that emulated Western fashion was already used to distinguish the more affluent groups from lower socioeconomic groups during the more than 300 years of Spanish colonial rule, and clothing styles still demarcate socioeconomic groups (domestic workers and administrative staff often wear uniforms, as observed during fieldwork).

In this next example, the energy usage of a Makati household with 14 members is presented (including eight family members: a grandmother, mother and father, two adult sons, the wife and two children of one of the sons, and six domestic helpers). Their monthly electricity bill was approximately 50,000 PHP, or less than 8% of their monthly expenses. The household has eight air conditioning units, seven refrigerators of different sizes, three stoves, three computers, five television sets, and two stereo systems as well as several video games, MP3 music players, and other electrical devices. At an average usage rate of 5,464 KWh/month, the eight household

Figure 7 Cover of the *Philippine Tatler,* December 2008. Photo courtesy of *Philippine Tatler*.

members consume 683 KWh/month, or, if we are to include the domestic helpers, 390 KWh/month (table 2). This family is spending more energy in absolute terms compared to the Tondo household: 30 times as much energy per household member, or 16 times as much, if the domestic helpers are included.

In table 2, we show the household members, income, electricity, and CO_2 emissions of the three households presented in this study. As could be expected, CO_2 emissions from electricity and income are correlated. The average Filipino CO_2 emissions from household electricity consumption were 0.1 tons per capita in 2005—consistent with the lowest socioeconomic household in this study. The fact that even the poorest have some access to electricity in Metro Manila can explain the fact that no household had household electricity emissions below the national average. The electricity consumption of the most affluent households, in contrast, had per capita emissions that were a factor of 27 higher than the least affluent households and the Filipino average. As lower income households attain higher living standards, household electricity consumption can be expected to rise accordingly.

Discussion: Opportunities and Challenges for Charting Transitions to Sustainable Consumption

The following analysis provides insights on consumption drivers by socioeconomic group.

Lower Socioeconomic Groups and the Limits to the Individual Choice Approach

It seems obvious, at first, that the least affluent groups could be encouraged to reduce their energy usage through arguments that promote lower electricity expenditures (or through more efficient devices) premised on the individual choice approach to consumption. They need to save money and could therefore be induced to meet this need. This particular approach, however, is too limiting in understanding choice sets among the lower socioeconomic groups interviewed and observed for this article: These household members actually do not have much of a choice. The physical structure of their living conditions *determines* their use of cooling devices. Without the fans turned on, the lack of natural ventilation in these units would make basic living for several people at a time unbearable. Despite the higher percentage of household expenditure devoted to electricity among this group, as compared to the two other groups, fans are left on continuously, because structural conditions do not allow for natural ventilation.

For Christer Sanne (2002), structural issues such as urban conditions for living and working, historical trends toward the individualization of society, and pervasive marketing techniques all lead consumers to become "locked-in by such circumstances . . . often deliberately created by producer and business interests." Cement structures are certainly the norm in Manila, and no building codes govern ventilation standards or require natural forms of ventilation, an institutional condition that must also be taken into consideration. An elderly woman remembered the housing conditions in the Manila of her youth:

> Most of the buildings are now made of cement. Before we used nipa roofing, the same thing for the floor. It's nice to stay in a nipa hut. Nipas were cut down in the swampy areas we had; they have become our farmland. It's hard to gather nipa for the roof.

Nipa huts, made from bamboo and a type of palm-thatched roofing, allow for the natural passage of air between floors and between indoors and outdoors. A return to such structures may be difficult to imagine, in terms of the time needed for roof maintenance as well as the challenge of using bamboo in high-rise structures. Cement constructions also have the advantage of enduring tropical storms and other weather hazards (a real estate developer interviewed also promotes cement structures as a way to reduce the risks associated with gun violence in certain neighborhoods).

Structural elements that facilitate the flow of air from outdoors to indoors could be integrated into building plans relatively easily, however. Innovative solutions may be found among the least affluent populations: A self-taught green architect has already begun helping households create rain-protected openings in their roofing structures to allow for the passage of air. It would be difficult, however, to accomplish such a retrofit in an already constructed cement building or to envision top-down urban planning that would include bottom-up building designs that originate from among the poor. As the construction industry continues to boom in Manila and other urban areas of Southeast Asia, policy makers should explore opportunities for mandating and enforcing building ventilation standards—particularly for low-income housing developments, so that the poor are not hit the hardest with rising energy costs.

The Growing Middle Class and the Influence of Global Trends on Local Consumption Patterns

An argument to help reduce electricity usage based solely on energy efficiency or a lowering of expenses would not likely be sufficient for the growing middle class in Metro Manila. As a real estate developer explained, "West is best," expressing his view that OFWs tend to emulate the housing styles and tastes of their host countries on their return to the Philippines, regardless of local climatic conditions that are vastly different from those of the northern hemisphere. The shift in housing construction trends from handmade and indigenous materials to manufactured and cement constructions has been documented elsewhere (Heyman 1994), and the idea that all groups imitate groups of higher social status is an oversimplification. Researchers must take global trends into consideration, however, when evaluating local energy consumption patterns, including the impact of migrant labor flows. If certain groups are emulating and importing wasteful energy consumption habits from the West, optimism around "leapfrogging" must be tempered. In particular, housing choices in the Philippines and other rapidly developing countries become structural conditions that will lock in the need for air conditioning for years to come.

Air-conditioning units are popular because they are tied up in cultural and social factors, but less energy-intensive forms of consumption are also gaining in popularity around the world. Solar panels could become symbols of economic success, for example, on the basis of a growing interest in renewable resources abroad and in the Philippines. Real estate developers and architects could also be prompted to design model homes that include photovoltaics, natural ventilation, and other features and to promote them as being more "advanced" and "fashion-forward" than air-conditioned homes. In contrast to air-conditioned air, the circulation of air from outdoors to indoors could be positioned as a health benefit, as long as the outdoor air quality is acceptable. In this context, reducing urban air pollution and the urban heat island effect are key strategies. The long-term cost savings of natural ventilation is also an important but subordinate message, particularly for OFWs, who often foot the bill for housing construction as well as for maintenance and usage over time. Various elements should be brought together in a comprehensive strategy that would reach different stakeholders, with a focus on OFWs and their families, in the Philippines and abroad.

The Highest Socioeconomic Groups and the Need to Address Secondary Social and Cultural Services

The wealthy may only represent a small percentage of the total population in Manila, but this socioeconomic group exercises influence on other groups: On outdoor billboards, on the

cover of magazines, and in the press, affluent Filipinos and celebrities set consumption trends that are emulated by some who aspire to these lifestyles. The idea of looking good is already tied to cool air for a broader group of people, as the rows of deodorizing products and colognes to counter perspiration might indicate (which often include the added feature of skin whitening).

For the highest socioeconomic groups, arguments around energy efficiency and cost savings would have very little impact on the reduction of electricity usage. Air conditioning provides a secondary social service: These groups do not just want to feel cool, they want to look cool and follow Western fashion and seasons. Policy makers could approach energy conservation without talking about energy at all but rather by addressing the question of housing styles and fashion, or challenging social norms. A new trend is already in the making: Although OFW and middle-income groups currently choose Western-style housing structures, more affluent Filipinos are moving toward contemporary interpretations of traditional housing styles that use bamboo and nipa materials. Nipa could become fashionable and cashmere unfashionable among the rich and famous in Manila, for example, with increased international visibility for local architects and the promotion of home-grown fashion houses. Fashionable people could be engaged within Manila high society to help in a campaign that would focus not on energy-saving messages but rather on lifestyle and, in particular, housing and clothing styles, through peer-to-peer persuasion. The goal remains energy reduction, but the way to get there may not be solely by talking about energy for this socioeconomic group.

A Socioeconomic Approach to Assigning Environmental Responsibility

Research on the distributional dimensions of energy use has found that inequalities exist within all countries (Jacobson et al. 2005). A similar study for the Philippines would most likely show the large inequalities described above for the three households types: The higher socioeconomic groups use the most energy per household member. More affluent Filipino consumers may share more in common with the average American than with other Metro Manila residents in less-favored neighborhoods, which underlines the need for a more micro-level distinction for carbon emission responsibility that could be relevant to post-Kyoto negotiations. Rather than assign "common but differentiated responsibilities" for climate change at the national level, recent research emphasizes the need to look at "the world's high-emitting individuals, who are present in all countries" (Chakravarty et al. 2009, 1). There is justification for calling the consumption patterns of these groups into question, with governments worldwide given the responsibility of understanding differences across socioeconomic groups and setting targets.

Conclusion

In Metro Manila, one of the key opportunities for more sustainable forms of energy consumption lies in institutional and structural choices regarding electricity generation and urban planning. Building codes are a priority, as well as an increase in renewable energy, particularly for the Luzon electricity grid. If consumers are to play an active role in transitioning toward more sustainable lifestyles, policy measures and communications that focus solely on moral or cost arguments around energy savings will not suffice. These approaches need to be seen as part of a more comprehensive strategy that addresses what we are calling here the social and cultural secondary services of energy-intensive products; this strategy would also be relevant to other regions of the world. In addition, any approach to understanding consumption in a local context must take into consideration the differences among local socioeconomic groups as well as the role of transnational populations. International negotiations related to sustainable consumption issues must also recognize the role of elite populations within developing countries and their responsibilities regarding resource depletion and pollution. Such awareness could translate into efforts that would focus policy initiatives on the highest emitting groups, regardless of their geographic location.

Once all of the evils are unleashed on humankind, Pandora is said to find Hope at the bottom of her box. This article has attempted

to balance what we know to be significant in terms of household energy usage in Metro Manila with how consumers perceive and use energy in their daily life. Consumption patterns can be assessed through quantitative data and analysis, as is usually the case in industrial ecology. The hope is that a deeper understanding of consumption drivers—and barriers—can be revealed through bottom-up qualitative research based on an approach to consumption grounded in economic anthropology. Not only can combining environmental science and social science help policy makers define priority areas, but this integration can also aid in designing pathways for sustainable lifestyles—an area of applied research that is currently lacking (Tukker et al. 2010)—while also determining what can be realistically expected from consumers, beyond moving to more efficient technologies. Consumer interviews and observations can reveal structural and institutional lock in conditions that limit room for maneuver at the household level, and also serve to identify social norms and standards that can then be contested. The complex issue of sustainable consumption merits the kind of context-based, systemic, and multidisciplinary approach that has been proposed in this article.

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