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From energy "needs" to sustainable energy: a case for personal carbon trading and locally-produced energy

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Abstract. This paper begins with a deconstruction of the notion of "needs" and energy "needs", with insights from anthropology, sociology and philosophy. The paper continues by recasting energy consumption and production into a socio-political stake with a reference to our common human condition and a list of several policy options to reduce energy consumption: the creation of a feeling of obligation, the green option by default, the necessity to address the desire for transgression, a call for social and cultural diversity of the socio-technical systems, the paradigm of climate justice, and an inverse scale of permissibility. The paper's main conclusions are that a local perspective is the best way to examine the links between energy consumption and its environmental consequences and that to join the relative necessity of "needs" and the paradox of the choice to be made for others while respecting the global ecological constraints, personal carbon trading could respect these two dimensions. A few prospective suggestions are made to make this tool more efficient in reducing social inequalities.

This paper summarises and develops a long chapter (See Bartiaux *et al.*, 2010) where we criticize the notion of energy "needs" and recast energy consumption and production into socio-political stakes. We thus attempt to continue the discussion initiated by Douglas *et al.* (1998) who noted that "the present social science conceptualization of human needs and wants sits awkwardly in the global climate change debate." (pp. 259-60).

Deconstructing the notion of "needs" and energy "needs"

Are "needs" physiological?

The notion of "needs" often implies that there exists a "human nature", universally shared. However, cultural diversity and the variety of conceptions of the 'good life' show the relativity of "needs". The misunderstanding originates in the assumption that "needs" are objective and universal whereas they are relative to cultural frameworks and individual subjectivities.

In the field of direct energy consumption, 200-300% variations in energy use in similar buildings are reported by Lutzenhiser (1993) and Gram-Hanssen (2010), among others.

Food and water consumption seem, at first glance, to be answers to physiological "needs", answers requiring a lot of energy in the production stage of food as well as during transportation. Regarding water, however, Cohen (1995) demonstrates that limitations associated with water strongly depend on human choices. Similarly, the World Hunger Program (Chen *et al.*, 1990) calculated that the planetary ecosystem could, in the present state of agricultural techniques and with the share of foodstuffs equalized, accommodate 5.5 billion individuals under good conditions, but only if they were satisfied with a vegetarian diet. If these individuals obtained 15% of their calories from animal products, the tolerable effective total would fall to 3.7 billion. The Earth could only accommodate 2.8 billion human beings if they derived 25% of their calories from animal products. The variations in these figures clearly show that capacity depends on the definition given to an acceptable diet. And so do vary greenhouse gases (GHGs) emissions when these emissions are calculated from farm to table. In a recent study of 20 items sold in Sweden, Carlsson-Kanyama and González (2009) showed a range of 0.4 to 30 kg CO_2 equivalents/kg edible product.

Are "needs" in a hierarchy?

The psychologist Maslow (1943) developed an approach of needs now famous for its conceptualization in the form of a pyramid. Maslow' hierarchy is the following from the basis to the top of the pyramid: 1)

Physiological needs (to eat, drink, breath, sleep), 2) body security, 3) social needs (communication, expression, and affectivity), 4) self-esteem within respectful relations, 5) implication, 6) accomplishment and personal evolution. He introduces a key distinction between physiological needs and other human needs – security, socialization, esteem, and achievement. Doing so helps build a narrow conception of "needs", relegating survival to the solely physiological level.

Maslow's pyramid raises many problems: satisfying the security "need" is necessary for satisfying "physiological needs" so both types of "needs" are intermingled: babies raised with food but without love and words do not develop properly (Strivay, 2006).

An illustration of the inadequacy of such a hierarchization may be found among the Cree Amerindians of the Far North of Canada. Traditional territories often radically change or even disappear because of a hydro-electric project (Niezen, 1993 & 1998).The energy "needs" of one people, urban dwellers of Montreal and New York, supersede the identity "needs" (the ancestral territory) of another people, the native Cree (Bréda & al., 2008). Needs of the others always seem weaker than the needs of the more powerful. These choices should be made by democratic procedures (see section 2).

Society as a response to human "needs"

According to Malinowski, institutions are the organizational means that human groups provide to meet their biological "basic needs" and their cultural "derivative needs". In energy policy and research, this way of thinking is still quite alive: states, and/or an international institution such as the United Nations' organizations, are seen as responsible for providing their citizens or members with adequate answers to "energy needs". The anthropologist Radcliffe Brown proposed an alternative to Malinowski's analysis, by comparing the different functions of culture as they relate to the "needs" of society taken as a whole. Therefore, both limit every society to a response to human "needs".

"Needs" are like a spiral

"Needs" are not static but instead dynamic. The "needs" dynamic is like a spiral, for it is able to integrate new objects of desire as new necessities. In other words, new possibilities become new desirable objects and further necessities. Peculiar wishes and "needs" seem to work within a logic of a more fundamental desire that is usually translated into singular and various "needs" and wishes, except when, being conscious of this structure of desire, one applies oneself to break it, namely by spiritual means, as in Buddhist groups. So "needs" related to our human condition are inseparable of the logic of desire (Arendt, 1958).

Like the notion of "need", the one of a "decent" lifestyle is worth thinking over. Indeed, it is impossible to objectively establish what a decent life would be as the answers and conceptions of a good life vary according to culture, time and even individuals within a period or society. Many parts of a societal system may interact to produce needs that become less and less negotiable.

In the energy field, Shove (2003b) illustrates this with the example of air conditioning and goes one step further by showing how the new possibilities are invented and diffused by social processes. By doing so, she clearly demonstrates that energy "needs" are socially defined and embedded in a specific socio-technical system made of building technologies, codes and standards, social practices, such as siesta, and shared expectations about a "normal" temperature that is adequate to answer to what is perceived as a physical "need" of coolness.

So, if energy consumption is to be diminished, one, two or all three components of the socio-technical system have to be redefined – techniques, social norms and social practices – in order to socially recast normality in a way that reduces energy consumption.

"Needs" in production societies

Marx (1845) introduces two important notions: on the one hand, some "needs" are related to our physical survival and thus are not created, and on the other hand, production-oriented societies manufacture an ideology of the "human rich in needs" to justify a logic of overproduction of which consumption society is the most radical version (Heller, 1978).

Bauman (2001) further discusses the notion of "need" in his framework of what he calls a "liquid society" that he defines by "one trait all liquids share: the feebleness, weakness, brevity and frailty of bonds and thus inability to keep shape for long." (Rojek, 2004: 301). In a "liquid society", "The future – the realistic future and the desirable future – can be grasped only as a succession of 'nows'." (Bauman, 2001: 22).

During the 19th century, Bauman shows that "need" was "the very epitome of 'solidity' – inflexible, permanently circumscribed and finite". Later, during the 20th century, consumption, and thus production, was driven by "desire, much more 'fluid' and therefore expandable than need" (Bauman, 2001: 14). Now, in our liquid society, "to keep the acceleration of consumer demand on a level with the rising volume of consumer offer", desire is replaced by wish as a motivating force of consumption (Bauman, 2001: 14).

Bauman identifies "a 'mutual fit' between consumer culture and the task posed to individuals under conditions of modernity: to produce for themselves the continuity no longer provided by society. He therefore explores the new forms of consumption formed from a shift from the functionality of needs to the diffuse plasticity and volatility of desire, arguing that this principle of instability has become functional to a modernity that seems to conjure stability out of an entire lack of solidity." These anxieties are "born of and perpetuated by institutional erosion coupled with enforced individualization" (Bauman, 2001: 9, 28). Said otherwise, "Happiness-named-consumption is a private utopia (…) 'deregulated' and 'depolitized' (…) and ceded to individual enterprise." (Rojek, 2004: 309).

He concludes, and so do we, that "To avoid confusion, it would be better to follow that fateful change in the nature of consumption and get rid of the notion of 'need' altogether, accepting that consumer society and consumerism are not about satisfying needs – not even the more sublime needs of identification or self-assurance as to the degree of 'adequacy'." (p. 13). To sum up, according to Bauman's conclusion, any initiative to save energy should match both individualization and institutional erosion.

Towards a reappraisal of consumption politics

A principle: our common human condition

Lifestyle diversity and the variety of the conceptions of good life lead to acknowledge that we do share a common human condition – rather than a common human nature – whose conditions are peculiar in each society. The human condition enables us to define "needs" through a minimal set of what cannot be absent: no human being could stop eating, sleeping, desiring or loving. But it seems impossible to positively define these "needs" such as the necessity to absorb this quantity of calories per day and per person… society institutes these criteria itself and in so doing, society institutes itself. Therefore, this introduces a policy dimension of the notion of "needs" via its normative dimension – a requisite and "an obligation to provide" – and thus "needs" correspond to rights, to which society should answer (Soper, 2006, 355 *et sq.*).

In the same way, the notion of "decency" or adequacy requires further precision because this notion does not make it possible to establish one lifestyle that would be acceptable by everyone. Choices and priorities may vary according to individuals, cultures and periods. Evidently, individuals, cultures and periods define for themselves their own lifestyles in very different manners, and characterize them as decent according to various criteria. An adequate or decent life might be variously defined as enjoyable, interesting, respectful, dignified, moral, entertaining, etc. But this definition of a lifestyle is valid only for those who choose their lifestyle *for themselves* and cannot be decided for others. However, it is clear now that these lifestyles must henceforth be defined while respecting global and local ecological constraints. So we need to get out of extravagant wasting as well as frivolously and myopic choices focused on a time span, from the industrial revolution to the current green revolution, that ignores what precedes or follows it.

The question is how to have this constraint accepted by those who want to remain in a selfish and expensive lifestyle. A frugal but decent lifestyle must be accepted by all segments of population and this lifestyle must be sustainable according to the given context – *e.g.*, ecological and social constraints when it comes to energy costs. Current ecological conditions thus must enter into the determination of whether our choices on lifestyles are decent for ourselves, our contemporaries and for future generations.

To the contrary and when it comes to establishing *for others* (and not for oneself) what a decent life is, it is clear that this decent life has to take into account certain physiological functions as priorities: food, hygiene, security… So a decent life for those others could be one that would allow them to feel free enough from the satisfactions related to the "naked life" – that life on which rests the possibility of giving and choosing meanings, and that could be characterized as secure for the maintenance and reproduction of life. In this respect, energy policy in Wallonia, the Southern Region of Belgium, includes several social measures, among which the gas and electricity utilities are prohibited from interrupting delivery of gas and electricity to their debtor consumers during winter because access to warmth is seen as a condition of a decent life. If it is impossible to know which priorities these others would specify for their lifestyle, the alternative is to guarantee a minimum threshold.

For example, if there were personal electricity quotas, a person could choose for himself/herself to use his/her quota to play on Internet rather than to cook a complicated meal. But this person can make this choice only for himself/herself. When the choice is to be made for others, the questions of meanings and significations must remain open in such a way that every group and every individual have different possibilities among which to choose.

Individual and collective changes

Soper (2007) theorizes a concept of 'alternative hedonism', where new practices of affluent consumers, such as eating organic food, arise as self-interested forms of disaffection with 'consumerist' consumption. Soper argues that this 'alternative hedonist' framework might "help to set off this relay of political pressure for a fairer global distribution of resources." (p. 223). She is probably overestimating the political impact of these affluent consumers around the world. Voluntary actions of affluent consumers will certainly be insufficient to substantially and rapidly reducing their carbon footprints.

But how can we reduce levels of desires that are very expensive energetically, either during production or consumption, or through disposal of their unwanted effects, such as non recyclable waste? Provided that austerity and frugality are not wanted for their own sakes but rather to constrain frivolous behaviour, several methods can be implemented.

Several policy options to reduce energy consumption

How to negotiate this relative necessity of "needs" with the paradox of the choices to be made for others whereas *sensu stricto*, only the concerned persons should make this choice for themselves while respecting the global ecological constraints? Below we try to provide a few elements of solutions that could be both efficient and acceptable, in order to progress towards the dual aims of reducing non-renewable energy consumption and in reducing social and economic inequalities at a global level and within countries. To be realistic and therefore more readily acceptable, energy policies should also take into account two characteristics of the developed countries. First, they should take into account the points of view of those choosing measures of common restriction, who would strive to make these chosen measures respected. And second, they should take into account the individualistic context in which these collective measures would be imposed, which in turn points to the relevance of including individual measures in energy policies.

These options can – and probably should – be combined in order to attain sustainable energy production and consumption systems.

Creating a feeling of obligation

It seems misguided to reduce "needs" in an authoritarian or paternalist way, even if paternalistic measures might be applied transiently. In environmental matters, the creation of a feeling of obligation as well as public infrastructure to enable fulfilling this obligation made behavioural change possible for sorting domestic waste during the 1990s in Belgium (Bartiaux, 2007). This obligation also relieved the consumers from making individual choices that would conflict with what they perceived as social normality. This positive aspect of mandatory but environmentally-friendlier measures is often overlooked by policy makers.

Green option by default

Another solution for relieving the consumers from making individual choice is to have the green option by default (Pichert and Katsikopoulos, 2008): people use the type of electricity that is offered to them as the default, thus changing default can be used to promote pro-environmental behaviour.

Addressing the desire for transgression

But these mandatory containment measures may also awaken the desire for transgressing them as seen, for example, in the difficulties in respecting the obligation to wear safety belts in private vehicles. One solution would be to provide access to certain uses under certain conditions, such as using the seat belt when one flies. Nobody obliges us to fly, but if we do choose to fly, then the conditions established by a collective can be imposed on travellers. In this respect, energy prices could include additional taxes for dealing with energy poverty, installing new infrastructures for producing renewable energy, and so on; this tax could be progressive, increasing with the quantity of energy used.

It would be better to readjust our "needs" in an acceptable scale for both the present generations and future generations. The choices of present generations should not mortgage the choices of future generations: for example, they should not choose irreversible uses of non-renewable energy resources.

Arguing for social and cultural diversity of energy (non) consumption

Although there are neither unique nor worldwide definitions of "need", globalization of the economy and extensions of western lifestyle has made "needs", and how they are met, converge worldwide. To thwart worldwide trends leading to escalating energy consumption, Shove (2003a: 199) concludes her book: "[E]nvironmentalists should argue for social and cultural diversity. They should do all that can be done to engender multiple meanings of comfort, diverse conventions of cleanliness and forms of social order less reliant on individual modes of co-ordination."[1]

Traditional building techniques are indeed culturally diverse. "If one begins to think green in a locally appropriate way, one will realize that traditional architecture was green in many ways." (Narain, 2010).

With the example of Kerala in Southern India however, Wilhite (2008) underscores that imported technologies such as refrigerators bring along "scripts" – their way to be used – and so potentially reframe practices and social representations (on good food, on women's paid work…) to the extent that they are consistent with other social changes. So Shove's call for more social and cultural diversity around the world faces another obstacle in the agentive capacity of bringing about change of some technologies themselves.

Integrating climate and social policies

Making policy links between social cohesion and sustainability objectives is a new challenge, both in the academic world and in policy arenas of all levels. Pye *et al.* (2008) did pioneering research in "Addressing the social dimensions of environmental policy". They showed that "Environmental policy interventions are likely to be regressive unless designed to mitigate such effects", for example by "increased social benefit payments to vulnerable groups, targeted subsidies for improved home insulation or energy-efficient products (e.g. the UK Warm Front programme) or general subsidies for public transport." (p. 6). Several policy instruments to alleviate and fix energy poverty are detailed by Boardman (2009) and many policy recommendations to find "the right balance" between climate change mitigation policies and social justice policies in Europe have been defined (King Baudouin Foundation, 2010).

The procedures: the "inverse scale of permissibility"

Linking energy consumption to the visible and potentially harmful consequences of energy production (see below) is in line with the "inverse scale of permissibility" (Jonas, 1980; Frogneux, forthcoming). This scale is a method for evaluating the distributive justice of the various options under consideration and it argues that an innovation should be legitimate only if its originators – those who are able to understand its stakes, who are motivated by this innovation and who may benefit from it either directly or indirectly – apply this innovation for their own selves and their own children. In other words, no innovation or technology can be defended if the ones who understand it, benefit from it and are motivated to develop it do not assume its consequences. By so checking the originators' integrity, it would be possible to better protect ourselves from an immoral politics.

This is a remarkably practical way to check *a contrario* that the enlarged mentality for an equitable justice is at work when a technological option is considered or when a costly option in terms of energy development is taken. Several philosophers, from Montesquieu to Rawls (1971), have argued that one's judgment is only valid if it receives the agreement of someone else who is situated in another socio-economic position, in another place, in another culture, in another time, or in another health condition.

Locally-produced energy and personal carbon trading

These two policy options are developed in more details below. Locally-produced energy is in line with the "inverse scale of permissibility" to assess the acceptable risks and requires a local definition of what is seen necessary. Personal carbon trading quotas are a way of integrating climate policies and social justice through their egalitarian approach namely to give to each citizen an equal right to consume energy.

Policy at a local scale with visible consequences

This notion of "needs" is like a mirror because we identify ourselves as having such a "need" by telling what we need something for and because the question of "needs" also involves the topic of who we want to be. It should thus be possible to regulate the pretentiousness of our claims about needs by raising the question of what we want to be, or preferably, who we want to be, whether as individuals or societies. These questions

[1] These individual modes of co-ordination often require car use and appliances such as freezers and dryers to save time. For example, day-care centers at workplaces would reduce car use as an individual mode of co-ordination.

are to be locally answered. Indeed, the definition of identity and common goals for a good life cannot be conceived on a large scale, but only for small and medium-sized groups. The envisioned dialogue should not be about the set of values shared, but rather (only) about the environmental costs of particular standards of living and foreseeable consequences of those options, even recognizing that not all consequences of our actions can be predicted.

Couvin, a small town in Belgium illustrates this point. One windmill with three specially-profiled blades produces an average of 450 kW, since a few years: this is enough to power half of local households. The originality is the local and social characteristics of the project, which is the result of briefings and field visits. This approach is a quite different strategy from the current binary approach to energy: either macro-production settlements (nuclear, hydro-electric...), or individual devices such as photovoltaic panels in United Kingdom (Keirstead, 2005), small windmills in Sweden (Tengvard and Palm, 2009).

Local authorities seem to be a relevant locus for these debates, which could be framed by national governments with the following principles: local production of renewable energy, without causing troubles for neighbouring municipalities, and with democratic procedures to guarantee that if energy production did increase, the local community would have to assume its potential harmful consequences. Furthermore, local authorities should become key actors in energy production (Cose, 1983; Tatum and Bradshaw, 1986; Hoff, 2000; Mesbah et al., 2007; Farrell, Morris, 2008).

Awareness of links between energy claims or demands and their visible consequences would then be immediate. Bringing new knowledge from practical (and hidden) to discursive (and explicit) consciousness has been indeed identified as a necessary condition for bringing about change in energy consumption (Hobson, 2003, following Giddens, 1984).

Personal Carbon Trading

Definition and advantages

Personal Carbon Trading "is a general term used to describe a variety of downstream cap-and-trade policies, which locate rights and responsibilities for the carbon emissions from household energy use and/or personal travel at the individual level" (Fawcett & Parag, 2010, p. 1).

The main features of carbon rations or quotas would be the following: equal rations for all individuals, tradable rations, progression reduction of the annual ration, signalled well in advance, personal transport and household energy use included, and being a mandatory, rather than voluntary arrangement (Fawcett, 2005).

Following Fawcett (2005), carbon quotas are interesting in that the points of departure to calculate them refer both to global energy demand and ecological criteria. Carbon quotas would be attributed to individuals (children's quotas would be managed by the responsible adults). They could be annual and initially calculated at the scale of a given country and according to various elements of context.

Personal Carbon Trading has the great benefit of quelling the illusory sense of infinite availability of energy. They allow the imposition of choices that are mutually exclusive, e.g., either use a household appliance or water the lawn. Furthermore, they highlight the futility of certain behaviours where only the enjoyment of the finished product is beneficial, and the other aspects of its life-cycle are costly. For example do we want to enjoy a mobile phone, but not suffer the fumes resulting from reprocessing?

Implementation: some prospective views

Should such carbon quotas be implemented, their amount and their evolution should be debated in democratic ways in different fora such as the Parliament, perhaps in representative councils on sustainable development etc. For example, with the support of empirical data, Pett (2009) raises the following question: is an equal carbon allowance equitable for those with chronic diseases, who are always home and need high levels of warmth?

To be acceptable, restrictions of carbon quotas should be progressive, as proposed by Fawcett (2005). This characteristic should enable both a sustainable change of behaviours (and maybe of representations) and a progressive acceptability and motivation towards measures initially imposed or, in other terms, a transition from heteronymous restrictions to autonomous restrictions.

Although these carbon quotas would have to be imposed, they could become accepted by the citizenry, since they allow an adjustment of ones' "needs", both on their "quality" and their "quantity". From a qualitative point of view, everyone would be allowed to establish his/her own preferences on how to use his/her quota

and whether to use it completely or not; on a quantitative point of view, everyone would be entitled both to sell or buy carbon rations on a carbon market and to produce renewable energy on a autarkic way –perhaps adding this production into the quotas, or instead using two distinct accounting systems (one for the carbon quotas, another one for the energy produced).

But the rules of the market risk favouring both overconsumption by most affluent people and impoverishment of poor people if carbon prices are low. Therefore, it could be necessary to correct this functioning by foreseeing quotas that would be managed by public authorities for other energy policies such as energy-saving infrastructures and research on these matters, as well as for others (such as people at risk who would sell their entire ration to survive, or for those who could not manage this system on their own). An additional mechanism could be taxation, potentially progressive, on transactions when buying additional carbon rations. Furthermore, these two mechanisms could be extended to reduce social and energy-related inequalities between countries.

Of course, the persons who impose these carbon quotas (and who are able to understand the stakes and the interest of these quotas) would have to be the first ones to respect them according to the inverse scale of permissibility and the most vulnerable people will be the last ones to be hit.

Conclusions

In this paper, we investigated the question of energy "needs" and of "decent lifestyle" and their social and cultural preconceptions. We have acknowledged on one hand that there are "biologic needs" related to every human existence and, on the other hand, that these are radically relative, historically and culturally A consequence of this observed relativity is the impossibility of defining as frivolous certain choices that a person or a community might make for themselves and consider an absolute necessity. The logic of "need" is never far from the logic of desire and wishes, and resists external constraints, even if they are collectively imposed and accepted, as illustrated by infringements of traffic codes. What makes the difference between survival defined as satisfying physiological necessities versus a life that is human (possibly in an austere way) and respects the environment and available resources may be the possibility of choosing for oneself diminished "needs" that are assumed as meaningful and not only as constraining. The autonomy principle grounds the difference between physical survival and austere life.

To enable a reappraisal of energy policies without being grounded in the notion of energy "needs", we include a reference to our common human condition and list several policy options to reduce energy consumption: the creating of a feeling of obligation, the green option by default, the necessity to address the desire for transgression, a call for social and cultural diversity of the socio-technical systems, the paradigm of climate justice, and an inverse scale of permissibility. In the last sections, we present in more details the crucial role of local energy policies and the personal carbon trading.

These are only a few options that should be further investigated. If these options are combined and if individual carbon quotas are supplemented by adequate collective infrastructure, these policy options would make it possible to implement the sentence often attributed to Mahatma Ghandi "Live simply so that others may simply live".

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