

Energy and Human Needs. An approach to energy poverty and sufficiency in uruguayan households (1963-2013).

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Energy, in its most basic definition, refers to the ability to perform work. However, extending this physical perspective, other conceptualizations of energy—from the social sciences—define it as a "social relations embedded in dense networks of power and socio-ecological transformations" (Huber, 2009). Here the vision of energy is relational and contradictory. It implies assuming that energy is both a profitable business and a tradable commodity in the world market and fundamental to the production and circulation of materials, as well as, an essential element social reproduction of life (Abramsky, 2010)

Thus, we can say that the relationship between energy and society are multiple and highly complex. The analysis of energy consumption is critical to understanding the history of mankind and especially for economic and environmental history (Folchi and Rubio, 2008).

It is no wonder then, that the relationship between energy and development has been the subject of several studies of Economic History (Cipolla, 1964, Wrigley 1962 and 1993, Kander 2002, Mar Rubio 2005, Malanima 2006, Smil 2011, Kander et al, 2014).

This relationship has focused on explaining the dynamics of substitution and incorporation of sources that constitute the energy supply throughout history and its relationship with the rest of the social and productive metabolism under the category of "energy transition". The speed with which these mutations are processed, and their links to the technological, political and social issues, have made this topic relevant to the discipline.

According to Folchi and Rubio (2003) setting the energy path in history involves analyzing at least five core issues: a) the evolution of energy production; b) its composition and breakdown by sources and forms of energy; c) the evolution of both primary energy consumption as a collateral; d) the composition of consumption according to sources and forms and e) the composition of consumption by productive sectors or activities.

Moreover, there are some explicit questions that should be made to understand these processes globally in comparative perspective: "How much has energy consumption increased per person, has it historically reduced the share of organic fuels in all energy sources? at what pace?, have increased their share of fossil fuels coal and oil?, in similar proportions?, What involvement have renewable energy sources among primary energy ones?, has expanded or reduced degree of country's dependence on foreign energy generation?, What has been the evolution of energy consumption in terms of energy efficiency "(Folchi and Rubio, 2003:2).

In this sense, little concern for the distributional implications of these energy transitions for the residential sector is striking. Could it be that the distribution problem in energy consumption of households is not relevant? Does the increased power consumption ensure universal access to it? Do the technological changes prioritize basic needs of neglected sectors or increase the conspicuous consumption of affluent sectors? Kammen and Dove (1997) warned that public debate focused more on technological developments related to electricity and transport (nuclear reactors and electric vehicles) at the expense of "worldly" technologies like efficient ways of cooking, heating and cooling, among others, being more appropriate for the whole population technologies. In academia, meanwhile, Birol (2007) warned that little attention was given to the distribution problem in the "energy economy". According to this author, the analysis of the top ten journals about energy showed that only 3% of the perpetrators were from the "underdeveloped" world and only 8% were about the problem of energy poverty and development problems.

This research project is based on the belief that while the rhetoric of sustainable development raises (and even causal) a holistic view of economic growth, social development and environmental protection, the reality observed in the Latin American context indicates that, on the issue of energy, there is a forgotten dimension: "the relationship between energy, poverty and development" (Kozulj, 2009: 7).

The literature on the distribution problem in energy consumption, based on a consensus on the level of participation of modern energy is a revealing measure of the wealth of a country, it warns that access to this form of energy and affordability is distributed very unevenly in the world. To illustrate the profound inequality that exists in the world, we can point out that energy consumption per capita in the richest 25% of the population is about 40 times greater than that for the poorest 25% (Kozulj, 2009).

Also, within countries, the distribution of energy consumption in households shows high inequality. The pioneering work of Jacobson et al (2005) estimates the Gini index for Norway (0.19), USA (0.37), El Salvador (0.60), Thailand (0.61) and Kenya (0.87) throwing differences in distribution between developed and underdeveloped countries greater than differences for the Gini income.

This paper proposes the study of energy poverty and energy sufficiency understood as excessive consumption ("sufficiency") for the case of Uruguay, in historical perspective is proposed. Thus, attempts to contribute to the debate on the distributional impact of energy transitions, most notably to the transition from the "oil era" to the "era of oil and hydroelectricity" (Bertoni, 2010) identifying winners and losers at the level of households, knowing that the overall distributional impact involves more extensive than those which we address in this paper looks.

Background

The concept of energy poverty is far from consensual and unequivocal. One of the most common definitions identifies it with those households without access to modern energy for cooking, light up and heating (Sovacool, 2013). Moreover, the definition of greater use in the "developed" countries, with a strong institutional anchor in the United Kingdom is the "fuel poverty" and it is considered poor somebody who cannot afford a minimum "thermal comfort" (Thomson, 2013).

The background of this work can be systematized in relation to three different concepts, although they are linked, including: fuel poverty, energy poverty and energy sufficiency. We intend to review the main contributions of each of these visions and then get in the history of this subject at national level.

The UN definition of fuel poverty refers to the inability to use modern sources for cooking and other basic energy services. This definition is based on a "physical" threshold type of sources that can be accessed and consumed (González Eguino, 2014).

This basic definition implies that "energy poverty" and fuel poverty are different things. The main argument for this is that while the first mainly affects the developing world, the second does mainly to developed countries (Li et al., 2013). In fact, there are about 1.3 billion people without access to electricity in the world, most of which are in Africa, Asia and Latin America (IEA, 2012), reaching very low levels for sub-Saharan Africa, where only 31 % of households have access to electricity.

For Latin America the total number of poor people has been estimated in late 2007, in about 200 million. Moreover, despite our continent has a high rate of urbanization, there are still 28 million people who lack electricity and a considerable part without access to modern fuels for cooking. According to Kozulj (2009), the poorest 20% of Latin American countries spend between 5% and 18% of their income on energy, while for the richest 20%, spending on energy represents only between 0.5% and 3%, this group consumes between 3-21 times more than the poorest 20%. Moreover, if we see who have no access to electricity on the continent, 73% of households without access are poor. This means that 10% of the poor and about 30% of the homeless haveno access to electricity services.

Thus, we can distinguish the problem of access to modern energy sources in developing countries-and the affordability problem not of access in more developed countries (Househam and Musatescu, 2012).

While it is beyond question the greatest levels of relative deprivation in the developing world compared to the core countries, there are at least three reasons to encompass "energy poverty" and "fuel poverty" in a unique concept: a) a look to a broader concept of "access" to energy; b) a critique of the theory of "energy ladder", c) political issues.

Analyzing some studies that have addressed the problem of access, we consider this dimension central to the objectives of this project.

Access to energy

Following Reddy (2000), energy poverty could be defined as "lack of sufficient alternative for access to adequate energy services, economic, reliable, secure and environmentally sustainable which help enabling economic and human development". More recent work, like Pachauri and Spreng (2005) also highlight the need to expand the concept of access, including security and "enough quantity" and affordability.

Under these definitions, it is not just to have access to electricity but also this access should be safe. In this sense, the problem of irregular connections could not be considered as an access to electricity kick households out of fuel poverty. It must also be "economic", so that access would also mean "affordability". The example of irregular connections remains of interest. The emphasis that perform the most narrow definitions of access, energy poverty conceived by the lack of public service of electrical connection, but the irregular connections are a good example of the need to pay the electricity tariff to access this service.

In this sense, when access has to be safe and economical, we distinguish between fuel poverty and fuel poverty becomes somewhat more difficult.

The first to describe the phenomenon of "victims of fuel poverty" were Isherwood and Hancock in 1978 (Lindell et al 2012). Their concern has its historical roots in the oil crisis of the 70s, which involved increasing the participation of energy services in household spending (Bradshaw and Hutten 1983 Obaldeston 1984, cited in Raho, 2012). Measurement of fuel poverty implied those considered poor households that spend more than twice the average "fuel, lighting and motive power" using the Survey of Household Spending 1977 for the UK (Lindell et al, 2012).

Anyway, the first work that managed to delve into the conceptualization and measurement of the problem and its diffusion was the thesis of Brenda Boardmans in 1988 (Raho, 2012). The definition of "fuel poverty" refers to those households that cannot have an adequate level of thermal comfort and operationalized considering households which spend 10% of their income or more to obtain these energy services. This threshold was based on the consumption of households in the three lowest income levels which spent on average 10% of their income on fuel (Lindell et al., 2012).

Subsequently, with the consecration of the monitoring and implementation, in the UK, of public policies around fuel poverty in 2001, the discussion about the concept has had wide ramifications. It has not only served to give greater account of the evolution of the "poor fuel" but to deepen the concept itself. Following Thomson (2013) we can identify three types of approaches to fuel poverty: a) the thermal approach; b) the income approach; c) the "consensual" approach.

The thermal approach defines a suitable temperature range and it is intended to measure if the home is within that range, if it is below, is "poor fuel". If it is difficult to speak of official measures, as much less than the universal-range of optimal temperature in homes has been adopted as a measure that provides an "adequate comfort" to homes that are between 21 ° C in the "being" and at least 18 ° C in the other occupied rooms (Boardman, 2010). Measures based on work with "medical" anchor recommend that the temperature should be between 18-24 ° C with people without mobility problems and properly dressed. However, it is worth noting that the World Health Organization warns that 18 ° C may be little to households with children, people experiencing physical disability or elderly (Raho, 2012).

One of the main backgrounds is to work Clinch and Healy (2002) for measuring the temperature of the households involved in the survey of 1500 households for Ireland. They found that 29.4% of the "poor fuel" was less than 18 ° C in the room compared to 8.8% of households that were not considered as "poor fuel" to the definition of income. Although the discovery of the discrepancy between what is considered fuel poverty and the internal temperature of households Healy (2004) believes it has a number of important limitations. First, households can heat the rooms knowing that they will be visited by interviewers and pollsters (Healy, 2004). Second, other studies for Central and Eastern Europe, where there are central heating systems that do not allow individual control of tobacco use, the internal temperature is often inadequate and in many cases very high (Tirado Herrero and urge-Vorsatz, 2012).

The income approach is the most widely used since the pioneering work and policy implementation in the UK, Ireland and France recognize it as an official measure of "fuel poverty". In addition to the history of Isherwood and Hancock (1978) and Boardman (1988) there are several more recent contributions that discuss and complement the extent of 10% of revenues.

The study by Healy and Clinch (2002) showed the problem of temperature and how the official measure does not necessarily correlate with homes they could not access the minimum thresholds for thermal comfort. Besides, the work of Todd and Steele (2006) stresses that are not considered cultural differences in the measurement using the income approach and not making it feasible -or even inappropriate- its extension to other countries and regions.

Moreover, recent debates about the need for a level of "theoretical" and not the actual consumption expenditure of households -empírico-. In fact, the Statistical Annual Report on Fuel Poverty (DECC, 2011) shows that for 2009 households should have spent 21% more than they did to cover their heating needs, so the measure based on actual consumption may be underestimating the fuel poverty. In turn, has discussed the advisability of using the absolute expenditure or expenditure relating to define fuel poverty (Boardman, 2012; Moore, 2012). Finally, the extent of 10% can include high-income households at very important luxury consumption. The report by John Hills

(2011) exemplified by "the rich that pump hot water in the pool", this way and under his influence, the British government adopted a new poverty measure fuel "Low Income High Cost" in 2013.

The use of a "single line" is not consensual. In fact, in Ireland three measures of "fuel poverty" that attempt to account for different levels of relative deprivation exist. In addition, there is debate about whether to use income with or without rental value, what benefits considered and which not to use disposable income and whether to use equivalence scales for determining the income per capita (Broadman, 2010; Hills, 2012; Moore, 2012 ; Thomson, 2013).

The consensual approach, which can be identified in some studies as Healy and Clinch (2002), Healy (2004) and García (2014), questions previous approaches mainly for methodological difficulty of obtaining accurate data for both temperature measurements as the availability of information on household characteristics, levels of energy expenditure and consumption patterns (García, 2014).

The consensual approach to fuel poverty has its genesis in Healy (2004). Based on the notion of "relative deprivation" -introduced by Townsend- argues that the physical, social needs should be incorporated dependent on social and institutional structure of a given place and time, as society changes and imposes new obligations to its members (García, 2014). Thus, developing a composite indicator indexes three objectives linked to the conditions and household equipment, and three subjective ratings, linked to measurements if people feel some kind of "energy requirement" unmet.

Critical views of the theory of "energy ladder"

The model of "energy ladder" implies a very particular vision of the historical dynamic of energy consumption in households. Assuming that as income increases in households, these go from more inefficient, cheaper and cleaner energy (eg. Coal and wood) to mdore efficient, cleaner and cheaper energy (eg. Natural gas and electricity) (Hosier and Dowd, 1987).

According to Sovacool (2013) argue that "energy poverty" and "fuel poverty" are two different things involved, somehow implies assuming that the "energy ladder" occurs, and further, each of the two measures realize of a type other than the "ladder" of deprivation. Assuming you have, as the country moves on industrialization progresses, advancing oil consumption and a decrease in the electricity and biomass (Hosier and Dowd, 1987)

Studies for many developing countries, shown as fuelwood consumption takes place across the socioeconomic spectrum, and even suggest that thinking firewood as "fuel poor" is a fairly irrelevant oversimplification. In addition, some of these studies show that low-quality fuels are not always the cheapest (Foster et al., 2000) and even replacing a fuel other is absolutely unusual.

Political issues

In the case of "fuel poverty" there are several studies that attempt to unify under a single definition for the European Union (Bouzarovski, 2012). One of the arguments is to give greater political visibility and ensure that all member countries adopt policies -and measurements and policies of combat associated. In the case of ambiguity that generates the distinction between "energy poverty" and "fuel poverty"

Broadening the concept of energy poverty.

Spreng and Pachauri (2003) and Pachauri et al. (2004) attempt to broaden the definition of fuel poverty by building an access matrix and energy consumption, expanding the sources, uses and consumption thresholds.

More recent work, broaden the concept of poverty transcending the definition of "residential" and including "private transportation" as part household energy consumption. The most relevant background are the works of Dijoux and Rosales-Montano (2009) and the more recent Mayer et al. (2014) who estimated using household surveys and polls energy poverty mobility for France. Incorporate energy costs of "individual motorized mobility" for determination of energy poverty.

Similarly, the work of Sovacool et al. (2012) in regard to expanding the definition of energy poverty, suggests incorporating not only the lighting, cooking and heating, but also the driving force and mobility. For Latin America, Garcia (2013) takes an array of absolute power needs based in the approach of Max Neef. Under this approach a household is in fuel poverty if the people who inhabit not meet the needs of absolute power, which are linked with satisfactions and basic economic goods, according to the social and cultural and historical conventions (García, 2013).

Energy sufficiency.

A comprehensive view of distributional problems in the field of energy consumption implies not only investigating the accessibility and affordability, but also the virtual excessive use that would result in problems of intra and intergenerational sustainability.

From this perspective, one of the pioneering work that attempts to quantify the distribution-and consequent inequity- in energy consumption was written by Daniel Spreng in 2005. His analysis of the target of 2000 W per capita not only emphasizes the determination of minimum thresholds for consumption but for maximum energy consumption, mainly justified by "green" reasons.

The concept of "sufficiency" or rather "eco-sufficiency" has as its central concern about reducing consumption, assuming it is possible to live well doing so, implying also cutting production (or generation in the case of energy).

Wolfgang Sachs (2009), one of the leading theorists of this approach, brings a perspective of sustainable development in which this appears to be linked to local life. The productivist logic (or developmental) is understood by him as the main cause of environmental degradation and social justice is a priority in the North-South dynamics. In this sense, it is essential that the domination of resources made by the North must be reconsidered, as it speaks of efficiency but misses the "sufficiency" of consumption and production (Sachs, 2009) is prioritized.

One of the central aspects of the concept of sufficiency is his criticism of the "rebound effect" of efficiency. The same is that when a resource efficient, frees up money that will be used in other devices or services that implied that consumption continues to grow (Kanschik, 2014; Figge et al, 2014).

While the concept is interesting, practically there is no history that attempts to measure the "sufficiency". According to Figge et al. (2014) there are some jobs that attempt to measure the effects of incentives to reduce consumption (Princen, 2003; Herring, 2006; Mont and Plepys, 2008) and others who do the same with production (Huber, 2000) also they try to make an integrated approach to measure the rebound effect also on the eco-sufficiency approach.

To size the problem in historical perspective it is interesting to find that was present among the concerns of Latin American structuralist thinking to analyze the obstacles to development in the region. According to Sunkel (1981) the highest value of the income elasticity of energy consumption for all developing countries is explained by the replacement of non-commercial energy sources and significant growth of services and transport and also because it is a more modern industry and capital intensive manufacturing requires higher energy consumption. But it also warns that the penetration of transnational style strongly influences, which has meant the dominance of the automobile and urbanization patterns.

National Background

At the national level, the most direct antecedent is the work of Cabrera et al. (2002). In it they build a basic basket based on the Survey Energy Use and Energy Consumption UTE 1994. They define a minimum level of energy consumption according to the uses they understand as fundamental. With that level of consumption and regarding in the Continuous Household Survey 2001 estimated the amount of poor energy in Uruguay is taking as threshold households that spend more than 10% of income on energy.

In turn, the work of Carracelas et al. (2006) performed a reconstruction of the tariff structure of the electricity sector in the long run, analyzing its link with the role of Public Enterprises and the broader economic model. His identification of three pricing models over the period 1912-2000 is very interesting because different distributional impacts can be inferred. However, the authors acknowledge that when using the

"average rate" they cannot dissect the different distributional impacts within each rate category. This limitation is one that will be explored in this paper.

The work of Bertoni et al. (2008) attempts to measure the impact of electrification on the residential quality of life. This antecedent is another extremely important one for my work as it estimates the relative cost of electricity tariff in relation to wages. Finding the most relevant increase in residential consumption-which gave way to Bertoni's thesis on "residentialization". Bertoni (2010) - occurs in the period 1946-1963 when power is increased eightfold, while services doubled, giving account for an intensification in the use of energy by households. To which must be added the spread of white goods.

From 1950-1975 there is an increase in power consumption and weight of spending on electricity compared to the average salary, which is also a result of intensification. However, between 1975-1996 the cost of electricity in the wage increased more than the average household consumption (Bertoni et al., 2008). To use databases of unexplored information by these authors Surveys Income and Expenditure and Continuous Household Survey will allow a better analysis of the relative cost of the fare in Uruguayan homes and identify efforts of a differential flow over the distribution of household income.

Moreover, the thesis of Bertoni (2010) analyzes the evolution of the energy sector and its links to national development. His work generates abundant evidence of the incorporation of modern energy to our country which caused a growing dependence on imported energy. He also argues that after the stagnation of state-led industrialization in the mid-fifties, the dynamics of residential consumption is "independent" of the global dynamics contributing to a strong imbalance in the energy sector in the context of what he called the "residentialization" energy consumption. In turn, in a work of 2011, he supplements that statement showing the problem of private household mobility considering the growing import and consumption of automobiles as well as the associated fuels.

While their claims seem interesting and wise, I understand relevant to analyze the supposed "independence" of residential consumption. Can we say that growth in demand for household energy involved dictatorship "independence" with the accumulation model? Or is it possible to think of an increase of "conspicuous" consumption of both energy in general as vehicle fuel and in particular as part of the dynamic model? The incorporation of private mobility and distributional analysis of households provide with new evidence about such questions.

The work of Amarante and Ferrando (2011) estimates the expenditure and consumption of energy services and drinking water in Uruguayan households. Their analysis is based on estimates from the Survey of Income and Expenditure of Households 2005-2006 which made an interesting methodological effort to estimate consumption that has

irregular electricity connection. Considering some of the objectives of this study analysis has the limitation of not incorporating vehicle fuels as part of the energy consumption of households, but it has the advantage of achieving a good description of differential consumption as income percentiles.

Theoretical Framework for Thesis Project

Thinking of a theoretical framework that allows us to analyze energy poverty -in its broadest sense and energy sufficiency implies a double challenge. First, following the line of Sovacool (2013) and Kanschik (2014) I decided to consider a definition of energy poverty that covers the uses for cooking, heating, lighting, engine and private transportation that in a perspective of "needs" implies at least try to answer the following questions: is it possible to find a threshold that meets the requirements-needs- or rather to identify energy poverty? What are those needs? Is there a pattern of energy consumption for its satisfaction?

Secondly, thinking about "energy sufficiency" requires no less than the previous effort. Is it possible to find a maximum level of energy consumption? Should it be made under assumptions of "sufficiency" in terms of "good life" or should be incorporated environmental concerns of conspicuous consumption? In turn, both poverty and energy sufficiency become more complex when the gaze is historical. Are the needs-and excessive consumption or luxury absolute or changeable according to time and place? What role does culture play in how we meet (or not) these needs?

To answer the questions expressed in the preceding paragraphs I make use of the contribution of three analytical frameworks I understand they can dialogue. First, a review of the concept of "human needs" and its various theoretical approaches (Maslow, Markus Heller, Doyal and Gough, Max Neef, Bolvitnik). Secondly, for the determination of "conspicuous consumption" I rely on two different theoretical contributions. On the one hand, the development of the theory of "conspicuous consumption" of Veblen (1899) and subsequent developments on "positional goods" (Hirsch, 1976). On the other hand, unavoidable, the analysis of consumption of Ecological Economics as a framework that supports the need to limit consumption (Martinez-Alier, Max Neef).

In this section, I refer to authors who I consider when thinking about an evaluative space of basic conditions for a dignified human life or human flourishing in its most philosophical definition. Briefly I will discuss the work of Maslow, Marxist theory of human needs of the School of Budapest (Markus Heller) contributions, the development of Doyal and Gough, some contributions from Max Neef and recent elaborations, by July Bolvitnik that strike me as strongly influenced by the School of Budapest.

The primeval contributions of Maslow. His analysis of human motivation imply a substantial contribution to the study of needs. Within its main contributions we can highlight the following: a) the need to focus on ends rather than means; b) the universality of the "fundamental human desires"; c) the satisfaction of certain needs enable the desire of new needs and they are organized "hierarchically" (Bolvitnik, 2005).

From point a) and b) it can be inferred, rather forcefully, two key issues of his thought: there are ends or (needs) which are universal, while the way of satisfying them is historically and culturally conditioned.¹

Regarding point c), Maslow noted that generally consciously want only what can be achieved. He even realizes that the possibility of achievement is crucial to understand the differences between the motivations according to social status, historical moment, and so on. In this sense, this position has strong similarities with the problem of "adaptive preferences" analyzed by Amartya Sen (2000).

His hierarchy of needs, known as pyramid-emphasizes the following order: a) physiological; b) security; c) membership, affection and love; d) esteem; e) self-realization. His analysis is not without a "social" look, since it postulates that the satisfaction of these needs should be given within certain social prerequisites, such as to guarantee the cognitive abilities of individuals who compose it (Maslow, 1943).

Human needs as the School of Budapest. The two contributions that I will take into account are the book "Marxism and Anthropology" by Markus (1971) and "Theory of needs in Marx" by Heller (1974).

According to Marx, man is part of nature and can only be conceived in metabolism with this. What distinguishes him from the rest of the "animal nature" is a very specific life activity: work. The peculiarity of this activity is to be well oriented to the "satisfaction of needs", does not directly but through mediation (increasingly complex as becomes more complex its self society).

In this particular look of Marx's view, the authors reach some important results. First, given that human activity is oriented with mediations to the satisfaction of needs, the space of the objects of that activity is liable to be expanded systematically.

Furthermore, the link between production and consumption becomes more diffuse, artifacts and things unsuitable for immediate consumption become necessary for the activity of working. According to Bolvitnik (2005) this implies that consumption and use in Marxism is not the same thing, as only a part of what is used is consumption, and this explains that man takes hold increasingly on "inorganic bodies." Is this the case for the significant increase in energy consumption?

Second is the work involves the transformation of nature and where previously them applied "natural laws" them begin to apply "social laws" (Marx, 1844). But also, the human being is transformed as well as its link with nature, emerging out new habits, potentialities, and so on. In a sense, we could say that man transforms nature of necessity but this process is reversed, resulting in which necessity transforms nature (Bolvitnik, 2005).

¹

We could say "socially" conditioned but in his analysis cultural aspects are first.

Markus (1971) emphasizes that the Marxist conception of the human being does not sharply separate the needs of (productive and non-productive) capabilities but understands both as "mutually conditioned". In this historical process, Heller (1974) understands that they developed the "radical human needs", which exceed the productive and social-possibilities of the capitalist mode of production.

Its central idea is that humans are "enriched" in needs and "become" in satisfiers, at the sometime, that the social body lives a growing process of "alienation" but increasingly "aware" of such alienation. Are those needs enriched material or spiritual? There is ambiguity in the concept but in this work we will choose the vision of Markus (and Bolvitnik) on this concern.

According to them, there is not a radical historical relativism in the reading of Marx human needs but he recognizes the presence of essentially immutable properties. There are certain human traits such as the social being his relationship with nature that are somehow "transhistorical" and that wholeness allows being taken as the basis of for analysis of the historical trend (Markus, 1971). However, in the development of Marxists Budapest there is not a taxonomy of needs that can an evaluative space of compliance, as there is in Bolvitnik.

The theory of human needs in Doyal and Gough (1991). Its theoretical development depart from the existence of some universal objectives (goals) as the full social participation and prevention of damage. Of these derive two basic needs that are physical health and autonomy, which they consider "critical autonomy" and that for its implementation must be able to satisfy certain intermediate needs, which in turn require some societal preconditions (Sarachu, 2003 ; Groppa; 2004; Bolvitnik, 2005).

Among his major contributions I will highlight two: a) they defend an objectification of basic human needs, while they consider them historical and universal; b) they distinguish between basic needs and aspirations ("wants"). In particular, this second contribution is of relevance to this project because it would distinguish the energy requirements to ensure the social reproduction of life in dignity, of those requirements that can meet aspirations that are not basic and can even be classified as "unnecessary" or "inconvenient" (eg having a big, comfortable car that consumes a lot of energy for its features).

In regard to the objectification of basic human needs, as in the Marxist approach, of which they take several elements, they assume that physical health needs and autonomy are essential beyond the historical and cultural differences, differing only in satisfiers (Doyal and Gough, 1991).

They also assume the existence of certain social prerequisites which can be summarized in four. First, the level of productive forces ensure sufficient satisfiers to ensure minimum levels of autonomy and physical health. Second, the existence of adequate levels of biological reproduction and basic conditions for the socialization of minors. Third they provide guarantees for the development of basic skills (eg cognitive through

an educational system) and they value necessary to ensure the production and reproduction in a more or less widespread way. And finally, a system of political organization that ensures the development of rules and regulations and compliance with them (Bolvitnik, 2005).

Moreover, they develop a list of eleven intermediate needs that must be met to achieve universal basic needs: 1. Nutritious food and clean water; 2. Protective Housing; 3. Means of harmless work; 4. Environment harmless; 5. Adequate health care; 6. Security in childhood; 7. significant primary relationships; 8. Physical Security; Economic security; 10. Appropriate Education; 11. Birth control and safe deliveries. There are reviews of the foundations of each of the selected items, and the justification is less comprehensive than the one performed for basic needs (Bolvitnik, 2005). Again, we can see the lack of energy as a necessity, something on which we will reflect later on.

The Human Scale Development of Max Neef. The focus of Max Neef et al. (1993) has recognized contributions of Maslow and Marx. The key ideas of his analysis lie in the distinction between needs and satisfiers and an exhaustive classification and characterization of the past, and they also rely on universality and tranhistoral needs. In fact they claim that "the traditional belief that human needs tend to be infinite; they are constantly changing; which vary from one culture to another, and they are different in each historical period they are incorrect, since they are the product of a misconception ... (which is not explicit) the fundamental difference between what is proper and what needs are satisfiers of these needs "(Max Neef et al, 1993: 26).

They understand that people have multiple and interdependent needs which operate as a single system. Here, it can be said that differ from Maslow as there are simultaneities, complementarities and trade-offs in the satisfaction of needs, while recognizing certain primacy of the need for subsistence.

This approach to needs distinguishes between the axiological character and the existential character. In the first, eight dimensioned needs are: subsistence, protection, affection, understanding, participation, leisure, creation, identity and freedom. The existential categories are being, having, doing and being (Max Neef et al., 1993).

By constructing a matrix of crossing needs in the existential axiological categories a space is left open for the "filling" with satisfiers. Consistent with his approach, it does not propose a list as it should be completed according to the historical moment and cultural conditions of the place. The interesting thing to note is that it also offers a typology of satisfaction that defines as follows: a) Rapists, are created to meet a need but end transgresses (ie the arms race, created to satisfy the protection but vulnerates it further); b) Pseudo-satisfiers, give the feeling of satisfaction but fail to meet the need (eg meet the need of affection with commodified sex); c) Singular, are satisfiers that only satisfy a need and no overall view (eg combat social vulnerability only with income); d) Synergistic, serve to satisfy several requirements at once. The example used in the text is breastfeeding. They say that while the bottle only meets the nutritional

needs of the baby, breastfeeding also covers the need for affection and protection (Max Neef et al., 1993).

This approach, like the above does not consider the energy a necessity but there is a recent history that, based on the matrix of needs described above, the method builds "Meeting Needs Absolute Power" and defines that criterion , "energy poor households". To do this he calculates a series of "satisfiers" use and possession of artifacts (economic goods) according to the absolute needs and energy requirements (García, 2014).

Human flourishing as Bolvitnik. The dissertation of Bolvitnik in July (2005) is an essential input for the project because of its comprehensive discussion on human needs and subsequent operationalization. His proposal makes synthesis of the analysis of Maslow, Marx, Markus Heller, Sen, Nusbbaum, Max-Neef, among others, and has the enormous advantage, for our purposes, to propose an evaluative space as "standard of living" operabilizing household data survey.

Human Poverty distinguishes economic poverty. The first covers materials and other aspects (eg emotional) while the second considers only the standard of living. The constituent elements of human flourishing -the most comprehensive conception of the human being are due to the development and expansion of both human needs and capabilities. In addition, subdivides the shaft axis of flowering and living standards in two: the aggregation level (societal and individual) and existential dimension of being and living (Bolvitnik, 2005).

In his work, he produces a set of indicators to assess the economic poverty in terms of living standards that will be central to our definition of "human needs". In fact, the approach we will adopt for the work, taken as main inputs theory needs Bolvitnik in good shape, a subsidiary of the proposals of the Budapest School combining it with previous working for the study of " absolute energy needs "made for Mexico (García, 2014). One of the central arguments will elucidate what basic human needs are and what their energy requirements are. In this regard, it is worth reflecting on the "centrality" I understand should have the "energy" in these approaches and as we saw, does not appear.

The "instrumental domination" of energy in human life. Having made a brief summary of the various approaches to the concept of human needs, it can be seen that there is no history except that of García (2014) for Mexico to consider "energy" from the perspective of the needs.

The fact is that energy is a particular type of "good" because it is "acquired" by using other goods (appliances) and that is why we speak of "energy services", since energy "works for us "providing us with lighting, heating, mobility (Sovacool et al., 2013).

In the more orthodox approaches to energy economics they often exemplify this position by calling energy as a "derived demand" (Bertoni, 2010). However, in this

project we follow the raise of the Schumacher, an economist who argued that "there is no substitute for power" and that far from being analyzed as a commodity must be regarded as the "precondition of all commodities." In that sense, there is an "instrumental domination" of energy as a "prerequisite material" for the production of basic goods to meet human needs (Sovacool et al., 2013).

In this sense, our theoretical efforts will lie in including in the discussions of human needs some considerations about basic social prerequisites, as it is the case with Maslow, Doyal and Gough and Bolvitnik- to energy services. This requires an extra effort since the concept of "instrumental domination" of energy reverses the conventional logic with which the "energy services" are analyzed. And they are not a "derived demand" from the use of any other good or satisfiers, but the precondition that allows such use and hence satisfies a specific need.

In this second section, I summarize the two main theoretical contributions that I use to think about the problem of energy sufficiency. On one hand, the analysis of the conspicuous consumption (and positional goods) and on the other hand, the analysis from the "green economy" and especially the "popular environmentalism" which is a "sub-stream" within the same frame.(Martinez-Alier, 1992).

Regarding conspicuous consumption, the first inputs are found in the work by Thorstein Veblen (Veblen, 1899). In his "The Theory of the Leisure Class", he studied in detail consumption practices, the formation of taste and its relationship with institutions. His psychological approach is different from the motivational psychology and the rationality that guide the "homo economicus". According to him, human acts are driven by five instincts: a) the effective work; b) the emulation; c) the idle curiosity; d) parental instinct, which involves ensuring not only its own welfare but for the future of the young; e) the self-preservation (Figueiras and Morero, 2013).

Thus, his vision about the consumption of goods realizes that the motivations for the same transcend the "usefulness" of the good itself and can also be due to reasons of status, of the image you want to spread to the rest. Thus, the relationship between price and demand becomes more complex, since you can buy at higher prices because of "emulation" (Veblen, 1899).

In his analysis of social dynamics, he argues that part of a sort of "pecuniary competition" based on the assessment by consuming forms. This plays the role of stating capacity to pay and social status, boasting implies position, displayed to those one wants to impress or please. In other words, make waste visible (Figueiras and Morero, 2013).

In that sense, there were neoclassical developments that tried to adapt the proposals of Veblen to this approach. The first antecedent was the work of Leibenstein (1950) who coined the term "Veblen good" whose main characteristic is that they are assets that increase their demand when prices rise and fall when the price decreases. (Figueiras and Morero, 2013).

Another interesting contribution in this regard was that conducted by Fred Hirsch in his book "The Social Limits to Growth" (1976). In his text, he developed the concept of "positional goods", the central idea is that they are a type of good that "loses its value" when many people possess them. Hirsch turned his attention to road congestion if everyone had cars- and rides on European beaches in summer as examples (Martínez Alier, 1992). While there is an ecological (or energy) concern, for the definition and delimitation of the concept of "energy sufficiency", to distinguish that part of the energy consumption due to the consumption of "positional goods" can be extremely important.

Likewise, the Latin American structuralist thought had in the 60s and 70s huge concerns about conspicuous consumption. Furtado's concerns about distributional issues behind the "stagflation" and the subsequent discussions of "development styles" clearly grasp it. They understood that in the periphery, growth patterns gave rise to a strong concentration of income and this resulted in an increased demand for durable consumer goods (positional consumption) implying increased import demand and reorientation of production towards the sectors with high density of capital, making economic growth less sustainable (ECLAC, 2014).

The analysis of Sunkel (1981) is perhaps the most accomplished and where more effort is made to see the link between conspicuous consumption and the energy problem. His analysis focuses on the problem of urbanization and spatial mobility associated to the automobile, as well as the increased use of space, water and energy for recreational practices with high environmental impacts. Its policy recommendation is eloquent: "Against insider consumer society seems logical to recommend measures to discourage luxury consumption, control their promotion, and lower or subsidize essential consumer goods. With regard to spatial mobility, it seems logical to recommend measures to reduce car use, improve public transportation, planning the location of residential, industrial and commercial areas to reduce the time spent on travel; and democratize the use of open spaces for recreation with minimal environmental degradation. Against energy waste is logical to recommend the systematic introduction of energy-saving technological innovations "(Sunkel, 1981:79-80).

Recent work such as Carlsson et al (2006) conducted an experimental analysis for Sweden. Taking some basic socioeconomic characteristics of households and analyzing their preferences, they find that cars and income are strongly positional while leisure and safety in cars are not.

The other school of thought that has interesting contributions to think about conspicuous consumption is the Ecological Economics School. One of his foundational works lies in the contribution of Georgescu-Roegen and his emphasis on the incorporation of the laws of thermodynamics to economic analysis. Anyway, you can find evidence of this approach in Podolinsky, an economist linked to the Russian populists (Martinez-Alier, 1992; Martínez-Alier, 2004).

The boom that had research in this framework following the oil crisis in the 70s did not lead to studies on consumption but already in the 80s began to be a clear research agenda about "sustainable consumption" (Ropke, 2005). The work of Martinez-Alier (1992) analyzes the "ecological" potential of the concept of "positional goods".

Perhaps the main nuance between "positional economy" and ecological economics is that for the latter, there is a strong emphasis on the use of scales of value to take into account "the nature" (Martinez-Alier, 2004). Hence, there are goods that are more important than others and that cannot be replaced, eg. goods that allow a minimum of basic human- end somatic energy.

Anyway, Ecological Economics has also a concern for maximum thresholds. Max Neef already proposed in 1995 the "threshold hypothesis": at a certain point of economic growth and consumption, the human being begins to decrease with increasing economic growth -and with the environmental degradation (Max Neef, 1995).

For our economic historiography on the energy issue, there are two key concepts that will be addressed in this paper. First, the transition from "oil age" of 1915-1980 to the "era of oil and hydroelectricity" from 1980 onwards. Moreover, the thesis of Bertoni (2010) which shows that one of the most noticeable features of the energy transition in our country is "early residentialisation" as well as an increasing consumption in the "private mobility" households.

In this context, it is worth questioning about some issues that will guide my research:

- 1) How did residentialisation process of energy consumption occur? Was it a primary goal or a product of the "spillover" of industrialization?
- 2) Given that the work of the CIDE (1965) shows how the kerosene (petroleum) was heavily subsidized and electricity, how did it impact on the subsequent transition of the "oil era" to the "era of oil and hydroelectricity"? Was it safe in distributional terms or did it differentially affect households?
- 3) As part of this historical process, can indicators be constructed that account for human needs and their energy prerequisites? Which thresholds do you identify? Can you quantify how many homes do not cover their basic energy requirements? And how many exceed the limit of sufficiency?

Similarly, the growth in the process of "residentialisation" until the 60s was such that the cost of electricity was becoming lower than the average wage. From the 60s, but changed the trend changed, it showed an increase of more dynamic consumption weight gain in electricity in the average wage until 1975 (Bertoni et al, 2008). Furthermore, in the 80s it begins to structure a rate change, which penalize the "residential consumption" so watching from 1975-1996 a turnaround in the cost of electricity in wages increased more than the average consumer housing (Bertoni et al., 2008). As well, they analyze the impact of exchange rate anchors during dictatorship in the 90s and consumption of artifacts which demanded energy had a significant increase.

4) Increased energy consumption for residential level -particularly electricity- and artifacts providers of such services were due to meeting basic needs of Uruguayan households or to consumption of positional goods for residential? What happened to the other energy issues?

5) How did the "exchange rate" in the 70s and 90s impact on the consumption of automobiles and fuel associated? Is it possible to incorporate private mobility in energy consumption of households?

6) According to the hypothesis of Bertoni (2010) on the expansion of private mobility, does it obey to the conspicuous consumption? What about greater distances from the residence to work? Does it obey to both?

Objectives

The overall objective of the project is to describe the uses and levels of energy consumption in order to analyze the energy poverty and sufficiency at Uruguayan homes for the period from 1963-2013 incorporating private mobility.

The specific objectives are:

1) To build an indicator of "absolute power needs" that allows to distinguish between households that do not gain access to these minima ("energy poor homes") and those who do so, in a historical perspective. That is, identifying the changes that are happening in consumption over time.

2) To determine patterns of conspicuous consumption, their link with energy consumption and to build a "high threshold" for identifying "energy sufficiency."

3) To analyze the relevance of the concept of "energy ladder" for consumption of Uruguayan households.

4) To incorporate the "private transportation" to the analysis of energy consumption of the households identifying the different types of use (recreation, care, labor)

Methodology

The empirical methodology requires a cut in 1982 where the first Income and Expenditure Survey in Uruguay by the National Statistics Institute was made.

For the period from 1963-1982, I intend to improve the estimates of the link between energy, cost and standard of living of Uruguayan households by Bertoni et al. (2008). In their analysis, which links the evolution of the price of electricity and its consumption level with the average wage, I will incorporate changes in the cost of other "energy" items (kerosene, gas, etc.). Also, to account for differential potential from the point of view of distribution I will supplement its analysis of the average wage with household data with the Census of 1963 and 1975. To identify differences in the level of access to electricity or possession of appliances will allow to improve the estimates made by

them for that period. The sources used are the price data from INE, the number of wages built by the PHES and the Census previously mentioned.

Since 1982 is when I want to improve the estimates. For certain human needs I can estimate the "energy requirements necessary" and identify which households have access to them and what households do not. Following similar methodologies to those applied by García (2014), but historically and geographically contextualizing them to our country. To obtain the amount of physical consumption expenditure from the survey I will rely on the proposal by Navajas (2008) which is basically to infer spending levels and the price structure and the consumed amount of each energy. A second contribution for this period constitutes the survey conducted by the Bariloche Foundation in 1988 with specific data for energy consumption for residential level estimated in physical terms.

The same estimaties will be replied with Expenditure and Income Survey of 1993-1994 and 2005-2006. The additional advantage for these two moments is that to identify the energy requirements there are two important precedents. First, the effort made by Cabrera et al. (2002) when using the Survey of Use and Energy Consumption 1994 they made the calculation that I will take as a basis for application to the Income and Expenditure Survey 1993-1994. Secondly, to make such calculations in 2005-2006 EGIH I will use as a basis the "simulator" of the National Energy Direction and data from the survey conducted by the Bariloche Foundation on use and energy consumption in 2006.

In all the above sources, I will show evidence about the f ownership of appliances trying to show whether they obey to "positional goods" or not and its relevance to define energy consumption. Thus, I will seek to approach the concept of sufficiency.

Finally, in the case of private mobility, I will supplement the information with Surveys of Origin and Destination of Intendencia of Montevideo (Town Hall) (1987, 1994, 2004, 2009) with the Continuous Household Survey which has a module on mobility and with the modules of "Time Use" of the Continuous Household Survey in 2007 and 2013.

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