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Various Corporate Citizenships in BoP markets

Céline Cholez, Pascale Trompette¹

Key words:

Accountability, Bottom of the pyramid (BoP), electricity, institution, market, politics, responsibility, sociotechnical agencement

Introduction

“Access to energy is a major preoccupation for the 1.6 billion people who at present live without electricity. (...) By setting out its solutions for access to renewable energies, Schneider Electric is reaffirming its social commitment to contribute to the improvement of the quality of life for populations ‘at the bottom of the pyramid’ and to facilitate access to care, treatment and education” (Press release: 'Electrification of the village of Marovato in Madagascar’, June 2009). Inventing clean and responsible energy solutions for populations in situations of extreme poverty, such is the radically new challenge, listed as a Corporate Social Responsibility (CSR) initiative, taken up by a team of engineers from Schneider Electric, a global energy company specializing in industrial electrical equipment. Like other multinationals, Schneider Electric has become involved in the design of products affordable to the poorest populations of emerging countries.

Of recent origin, the concept of ‘Bottom of the Pyramid markets’ (Prahalad, 2010), close to concepts such as ‘social innovation’, ‘inclusive innovation’ (Mendoza & Thelen 2008 ; Mair & Marti 2009) or ‘frugal innovation’ (Bhatti & Ventresca 2012; Sehgal & al. 2010), describes a set of initiatives taken by private investors, and among them by multinational companies, linking the development of innovative products/services to the fight against poverty (Dalsace & Ménascé, 2010 ; Mair & Marti, 2009). With regard to the traditional concepts that prevailed up to this point, the driving role of free enterprise, of private investment and more fundamentally of the market, are strongly upheld in this neo-liberal model as the potential driving force in the dynamics of development in Southern countries. According to its proponents, the ‘BoP’ markets vision carries the ambition of promoting a dynamic of market expansion to include the poorest in society (through a logic of economic and financial ‘inclusion’) (Budinich, Reott, & Schmidt,

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2007). The companies involved in these experimental projects have been induced to think, to invent, and then to design innovative assemblages in the supply of products/services in connection with the deployment of new value chains 'including' the poorest both as consumers and as producers (Karnani, 2007).

Although they are assimilated to a market strategy that does not require financial aid, most of the firms' BoP projects are developed in the framework of CSR policies. Following the academic instigators of the 'BoP vision' (who mostly come from business schools), the corporate managers present these projects as a new form of CSR which both combines social and economical objectives and deliberately breaks with the 'charity approach'. Each company aims to develop their core competencies by creating a sustainable business model. Assuming that the main problem is one of access to the products (because of the weakness of existing market infrastructures and of the 'consumers' limited capacities for paying), the challenges appear primarily to be technical ones: reducing prices, penetrating the most distant zones and possibly facilitating the act of purchase with leasing or credit systems. However, the ethnographic studies of these projects (Dolan & Johnstone-Louis 2011; Cholez, Trompette & al. 2010) show that the firms are confronted not only with questions of technical innovation but also of 'market design' and that these questions carry political concerns.

Based on in-depth empirical research in partnership with Schneider Electric, we follow here how actors of a BoP project face various political concerns in the multiple demands for reconciling responsibility and mass consumption, ecological norms and low-cost criteria, sustainable development and poverty. We observe how the different market designs either 'enlist' the support, or on the contrary push to the side lines, the multiple actors concerned (governmental institutions, NGOs, intermediaries of local enterprises, BoP consumers, etc.). The company explores two distinct solutions. The first is based on electrification through the setting up of small decentralized electricity power stations in rural villages functioning on the basis of renewable energy. The second follows a parallel but less visible market, involving the provision of individual equipment of diesel generator or of batteries. Both of these alternative paths involve chains of associations and interdependencies, which combine technical assemblages, public framing (rules, requirements, financing devices), and economic formulas (business plans, tariffs, payment systems, etc.), and partnerships (entrepreneurships, cooperative associations...). Moreover, as we shall demonstrate, they are also related to different forms of corporate citizenship (Matten & al. 2003; Matten & Crane 2005). It is our contention that these forms of corporate citizenship are organized around the alternative between, on the one hand, a rational-legal context of public service where the corporation acts as substitute for the government, and on the other hand, a market circuit around a product sustaining new forms of economic and ecological values. Therefore, these two solutions may diverge in their respective mode of regulation (framing/overflowing) and accountability. In the following, we develop these points according to this plan: we first present BoP strategy and how it is related to issues of corporate citizenship; we secondly detail our theoretical background and our methodology broadly inspired by pragmatic approaches of markets and technologies; then we expose the two solutions explored the firm of our case stud; and finally we discuss the different forms of corporate citizenships the different designs market involve, and the issues of accountability and of regulation of overflows associated.

The BoP strategy: a corporate citizenship object

Developed in the early 2000's, the concept of 'Bottom of the Pyramid' markets (Prahalad, 2010), rests on what its proponents see as a win-win gamble that associates the search for profits and the presumed willingness of poor people in developing countries to consume and to develop entrepreneurial skills. The idea - theorized by famous scholars in management strategy, notably C.K. Prahalad and S. Hart (Hart & Prahalad 2002) - is that the delivery of 'quality products and services', affordable to the four billion potential consumers whose daily incomes do not exceed \$5 represents some considerable business opportunities for corporations at the same time as acting as a driving force for sustaining the economies of the developing countries.

Associated to CSR approaches, 'BoP vision' is often presented as a radically new perspective on the way in which corporations can support social issues. Its instigators insist on the necessary break with the common charity approach that would make the poor dependent and even 'child-like' without effectively alleviating poverty over the long term. Each company in its own sector has to identify the societal issues it is best placed to resolve, without requiring financial aid, as a condition of attaining economic sustainability. For international companies, it is not simply about introducing a societal concern into its product or supply strategy, but stretching the market towards a hitherto excluded space: that of poverty. In theoretical terms, this proposition places 'BoP vision' as a direct opposite of the 'social business' model of Muhammad Yunus (Yunus & Weber 2007): the BoP goal is clearly to make profit while the social business goal is to solve social issues with the market as one of the means of achieving success.

Initially, the 'BoP concept' aroused both enthusiasm and controversy. The main critics came from the academic arena and were about the efficiency of the market as a means of alleviating poverty (Walsh & al. 2005), the over-estimation of the purchasing power of the poor (Crabtree, 2007; Landrum, 2007) and the moral condemnation of the 'value-conscious' consumerism philosophy (Karnani, 2007). The critics of the first experimentations, including those of an American global company that developed a large distribution of some daily sachets of detergent in India, led to a significant change in the BoP approaches (Simanis & al. 2008). The involvement of the local producers, and the wish to contribute to the development of a local value chain as well as the introduction of environmental criteria reinforced the concept but also made its implementation more constraining. At the heart of the questioning in the scientific community as well as among the economic and political actors lies the problem of creating a market and 'making it work' with lots of uncertainties, both because of the 'improbable' consumer market (the weakness of market infrastructures, the limited capacities for paying of the targeted market and the existence of consumer practices remote from western anthropological models) and also because of the attendant high social expectations (the fight against poverty and the need for solutions which are ecologically clean/sound). The result is a complex equation that leads corporations to different design formulas: from entirely integrated markets (Cholez, Trompette, Vinck, & Reverdy, 2010), to co-development with NGOs and local users (Burdinich & al. 2005).

Following a neo-liberal conception of the market and its efficiency, the BoP literature pays little attention to local and national political institutions in the developing countries. Public authorities

are considered as absent or weak (Seelos & Mair, 2007). The BoP strategy message is often based on mistrust of local institutions, which need to be overcome or 'bypassed' as far as possible. In a sense, the BoP strategy is presented as an authentic 'auto-regulation' of social or societal problems by the company itself, which would be able to deal with or assume the regulatory or financial incentive constraints. The BoP vision promotes the corporation as an agent of regulation, which can compensate for the weakness of local government, a rather simplistic vision which miss out the political issue of reciprocal responsibility between the state, the corporation and local communities, as demonstrate by Idemudia (2012) in this book (chapter x).

There has been much emphasis in the literature on tackling the link between business and social issues (Valor, 2005). Considering the issues we have described above, we think relevant to analyze BoP projects in the light of Corporate Citizenship (CC) as Crane and Matten re-conceptualized the concept (Matten & Crane 2005; Crane & al. 2010). In fact, unlike the concept of CSR, the citizenship metaphor provides an extended view of the political role of the corporation. Crane and Matten suggests three different ways of playing this role: first, corporations as citizens, which contribute to the democratic debates, for example when corporations offer services and products dedicated to minorities; second, corporations as governments when they substitute themselves for public administration and government; thirdly, corporations as an arena for governance issues including a variety of stakeholders. The development of BoP markets could present lots of implications for understanding corporate citizenship processes and, in the opposite sense, the corporate citizenship perspective allows some interesting political issues concerning BoP strategy to be addressed, specially concerning the management of overflows associated to these markets and the making of accountabilities. As shown by Gerencser (2012) in this book (chapter x), accountability is central to display the social benefits of the corporation initiative.

Understanding the market as a design process

Within the sociology of markets, the dynamic aspects of market design have been adequately studied through by pragmatic approaches (Callon, 1998), with attention paid to the growing role of experiments in the governance of markets (Muniesa & Callon 2007). In this text, this background will be combined with two complementary theoretical strands, included here because of their potential contribution in dealing with the political dimensions of market design: the 'politics of technology', i.e. assuming that technologies participate in 'the ordering of social collectives' (Berg, 1998); and also 'accountability' as a combination of calculative and narrative accounts as witness to the company's commitment to citizenship requirements.

1. A pragmatic approach to market design

This analysis of the company's exploratory activities prior to the market design stage is associated with a pragmatic position, in order to trace the emergence of entities and overflowing throughout the building of new assemblages. This position offers an alternative to traditional institutionalist and relational approaches in economic sociology, by emphasizing the process of 'enacting the world through action' (Overdevest, 2011): the 'reality test' is central to the experimentation of

‘shifting assemblages’, through which failure or success are experienced. We therefore propose to examine the activity of the company and its commitment in BoP innovations as an ‘on-going experiment’ (Callon, 2009; Muniesa & Callon, 2007), or more over an ‘on-going exploration’ in the design of a new market. Even if, in Callon & Muniesa’s program, the experimental setting mainly refers to the expertise of economic science and, beyond, to its performativity on the market governance, in our case, the ‘in situ’ experiment consists in testing various solutions in order to delineate the sociotechnical network and the value chain.

The company explores, in the same time, the potential offers, affordable to the poor, the feasible socio-technical *agencements* and the specifically related BoP market designs (Caliskan & Callon, 2010). As the authors suggest concerning the different types of market experimentation: “the list of actors actually involved in this kind of experiment (i.e., the identity and power of the different actors that are to be engaged in the experiment with the potential to alter its course) is not defined a priori” (Muniesa & Callon, 2007, p. 178): the exploration of a market around a technical solution, a particular branch of activity or a public programme necessitates taking into account certain actors (governments, local small and medium-sized enterprises, cooperatives, NGOs, the BoP consumer, the micro-entrepreneur) while excluding others. The analysis of this exploration follows a chain of interdependencies which has its own dynamic; it progressively defines a sociotechnical *agencement* that ‘combines material, textual and procedural elements’ but also seeks to pinpoint possible overflows and the constraints of alignment.

2. *The politics of technology: framing and overflowing*

From this pragmatic background, we draw on a set of research on the ‘politics of technology’ (Berg 1998; Lavelle 2009; Winner 1999). The pragmatic approach of techniques has long shown that artefacts play a role in ‘ordering’ the world: artefacts incorporate scripts of use, provide ‘grasps’ (i.e. affordance) (Bessy & Chateauraynaud 1995), structure interdependencies, configure the user, assemble distributed cognition (notably as calculative agency). In short, they achieve association and alignment. This technical mediation ‘folds in’ and produces moral and political relations (Latour & Venn 2002). In the Foucault’s tradition, the ‘political technology’ supports the governmentality of society in various way. A. Von Schnitzler (2008), for instance, has shown how the development of prepayment technology in South Africa can be interpreted as a central piece in the re-building of a new biopolitic infrastructure connecting the citizens to public services in a context of neoliberal reforms. In a less ‘panoptic’ perspective, Latour’s program confers moral properties to technologies in the way they ‘displace, translate, modify, or inflect’ the ends themselves.

This line of investigation meets the pragmatic approach to markets, notably in emphasizing the central role played by *agencements*. The market design as an ‘arrangements of *agencements*’ describes a lengthier chain of actors or agencies, of different or even asymmetrical status (political actors, intermediaries, consumers and also texts, devices, technologies, etc.). Our analysis pays attention to the way political ends are translated into instruments, technologies, and accounts as various forms of ‘political agencing’. Indeed, following the corporation in the exploration of rural electrification solutions, we explore the properties of the solutions as two types of ‘political agencing’: the local station, as a public service infrastructure, which relates to a complex

assemblage combining a host of actors (local and national government, local companies, MNC, banks, etc.), procedures (heavy administrative burdens) and techniques; and in the opposite case, a very simple technology (a ‘nudge’ for Thaler & Sunstein, 2008) performing interactions and behaviours: the product itself incorporates a set of incentives to support ecological and economical practices through its ordinary use by the poor.

3. *Distinct Forms of Citizenship Accounts (or Régimes of Citizenship Accounts)*

In the field of organization theory, the concept of ‘accountability’ relates to a long-standing tradition of research on the accounting practices within the companies and their cultural meanings, focusing either on the financial reporting’s or on the ordinary management practices. With the raise of democratic and societal requirements addressed to the private sector, the concept is spreading to a certain extent: corporations do not have to account only to their shareholders, but also the civil society, with reports on their social responsibility and ecological impacts. The responsible reporting becomes dominant in regard to the pure accounting activity, even if these two dimensions remain inseparable. Close to this idea, D. Stark (Stark 2009) proposes the notion of ‘account’ (of worth) to refer both to *accounting* and *narrative* activities within the company.

If the issue of accountability, especially relating to this societal or citizenship definition, is attendant on any BoP project, the question of how the corporation addresses this accountability requirement remains. As mentioned by Crane and alii., corporations are not initially set up for political tasks and their accountability procedures remain rather undeveloped. In our innovation story, we investigate the way a new product or service becomes ‘accountable’ and who are the main stakeholders involved in the accountability process: what are the calculation procedures carried over by each solution? Who is accountable to whom and for what? Which types of citizenship demands are delineated by the different solutions? Again, we suggest two forms of accountability relating to each solution. One refers to bureaucratic accountability procedures: the electrification solution, defined as a local public service infrastructure, is part of the off-grid electrification plan of the government. It is closely framed by procedures for allocating rights and duties, control of equity, business planning, involving numerous institutions. On the other hand, the second solution relates to an accountability attached to the product itself and its use: it depends on the way it generates new forms of consumption and calculation during its use and throughout the market transactions.

Method

As already stated, this article is based on collaborative research carried out within Schneider Electric, a global energy company specialising in electrical equipment. This firm entrusted the university researchers with carrying out an ethnographic study of one of the test countries and then subsequently associating these researchers in the creative work which formed part of the

first phase of the project design stage². The ethnographic information, produced both from the work done jointly with the company's engineers and during the field survey on the investigated sites, includes:

- internal discussions within the company's staff, observed or recorded during BoP market project meetings;
- a set of e-mails exchanged between the different actors involved in the experiments from the beginning of the project through to delivery of the equipment and a set of documents produced or collected by the engineering team at the beginning of the project;
- transcripts of interviews and observations realised during a survey of 4 rural villages in a developing country (2 electrified and 2 others in the process of being electrified): 52 interviews with local energy operators, political actors and representatives of public institutions (politicians, religious and traditional leaders and a representative from the local national electrification agency), potential customers from the local business community and local project partners (NGO members, engineers from the local subsidiary responsible for the BoP projects, development personnel from other multinationals involved in the experiment). The survey also includes 2 filmed studies of local actors' diagnostics of technical and organizational dysfunctioning in the devolved electrification systems.

The material collected has been subjected to analysis at three levels: the network of institutional and political actors attached to the electrification project, the role of energy as a consumer good in the BoP economies, the relations of interdependence between operators, users, maintenance and other staff introduced and regulated by technical systems.

Innovating for the BoP: between accountability and peripheral markets

The CRS approach began for Schneider Electric in 1998, with the creation of a foundation and then a sustainable development department in 2002. The BoP programme was launched in 2008 with highly ambitious objectives: giving access to electricity for one million BoP households in three years, training 10,000 young BoPs and supporting 500 entrepreneurs in the local development of the energy sector.

Searching for long-lasting innovation for developing countries whose political and economic systems seem totally foreign to such an aspiration, the R&D team launched themselves into the BoP adventure with totally open and inquisitive minds (even to the point of considering frugal solutions independent of all forms of generated energy, holes for stocking ice, for example). This exploration initiative was undertaken when the basic properties of the equipment to be used were still undecided on the technical level (solar panels, wind-power, biomass, hybrid solutions, etc.) as also on the economic and social levels (decentralised power stations or individual equipment,

² The university team reformulated the commission to assess the 'acceptability of solutions' into a study of existing local practices and systems. In this way it can be said that the university team played an integral part in the process of assessing the different assemblages and that this case constitutes a stimulating perspective on the question of how sociological and anthropological knowledge can be integrated into market design (Callon 2009).

private operator or cooperative venture, etc.). For each possible solution, it was a question of identifying and defining the chains of dependencies which the solution entailed without presuming of course to dictate thereby the nature of the links and forms of coordination which would be in play (political exchanges, technical chain links, legal forms required, etc.) (Akrich, 1989). It involved calling into question the specific properties of the assemblages and the forms of alignment which ensue. The exploration work was supported by the analysis of some 'reference situations' (for example the study of villages already electrified by other actors working with decentralised network power stations), through experimentation (for example setting up an ad hoc electrification pilot project) and the analysis of existing systems (notably solar home systems or individual equipment).

1. The decentralised power-station: the weight of bureaucratic devices, the discipline of the BoP consumer

The first electrification solution explored by Schneider Electric was based on the concept of a decentralised (off-grid) power station. The assemblage would associate an electricity production power unit from a renewable energy source (photovoltaic, hydraulic or bio-mass) and a mini-transmission network (for a village of less than 100 houses) through aerial wires, controlled from a command post for directing production and consumption. Two experiments³ have served as feasibility studies: Antetetzambato, a village of a hundred or so houses on the High Plateau of Madagascar where fifteen years ago, through an NGO initiative, a localised power station had been installed based on a hydraulic energy source; and Marovato, a village of twenty of so houses on the east coast of the island where Schneider Electric set up in 2008 a localised electricity supply based on photovoltaic energy⁴.

i. An institutionalised technical solution

The initial idea of developing a decentralised network power station came as an almost 'natural' choice for the Schneider engineers, even if from the beginning its advantages were balanced by more individualised solutions (solar home systems) and other hybrid solutions based on extending the station's range over a wider rural zone (through coupling with mobile batteries, for example). The concept of a decentralised power station benefits from a sort of cultural heritage and institutional legitimacy: coupled with technologies based on renewable energy, it figures high, and has done so for several decades, among the development programmes proposed in the fight against energy scarcity in the countries of the South supported by the main actors in development, including both the big international organisations (the World Bank and NGOs) as well as the governments and local NGOs concerned.

In Madagascar, the decentralised power station is seen as the all-embracing solution to be developed on a national scale and has been promoted for the rural sector by the reform of the

³ A third study was also carried out in a non-electrified village on the east coast where we monitored a Madagascan entrepreneur working in collaboration with the ADER (Agency for the Development of Rural Electrification) on a market study plan prior to requesting authorization for its implementation.

⁴ The Antetetzambato network is supported by a French NGO working in association with big international investment funds. The Marovato network is part of a local development programme sponsored by the World Bank.

electricity sector which was initiated in 1999⁵. Supported by the big financial donors (the World Bank and the SFI (*Société Financière Internationale*), this reform very much favours the independent private initiatives undertaken apart from the National Electricity Company (Jirama). So exploring the development route based on the concept of the small independent power station is supported by a series of public initiatives, of either a normative or strongly incentive nature. These initiatives are operated by the main government actor, the ADER⁶, an agency in charge of the rural electrification programme, which exists to assist, give counsel and expertise, to subsidise and seek financial aid for projects and their subsequent implementation by small and medium-sized enterprises or by the NGOs. With its own specific policy for developing and regulating the electricity sector, the government negotiates its priority investment programmes with the relevant regional and local authorities, and these negotiations can involve complex political manoeuvres. Private operators receive strong incentives to opt for technologies based on renewable energies, through exoneration of custom duties and often with additional financial aid. Legal concessions grant operators a local monopoly as a way of guaranteeing return on investment. If this agency has largely contributed to facilitate the subsidizing of the installations, this institutionalization of decentralised power stations as part of official governmental electrification programmes has also brought with it more rigorous regulatory controls in terms of price-setting and management procedures: the price of the kw/hour is aligned to a national tariff (even though initial production costs are much higher than any return possible on the prescribed tariff), the rules for standing charges for customers must conform to standardized fixed rates or monthly metered charges and these conditions of sale are strictly controlled by the ORE, the National Office for Electricity Regulation.

With its heavy commitment to immovable property investment (the power station and transmission network), its high investment costs in clean energy, together with its public governmental authorization costs, the decentralized power station option is characterised by a panoply of investment formulas, long-term economic planning instruments (business plans), legal frameworks (monopoly, norms) and regulatory arrangements, all of which are essential elements for upholding the stability of business commitments covering the whole chain of actors: the financial investors, the public authorities, the local operator and the links through to the final consumer, a consumer permanently tied to the network through long-term contracts. The network therefore constitutes a first type of assemblage in which solid technical and institutional links provide a powerful framework of interaction between the various market actors.

Developing innovations associated with such a network system means establishing well in advance a market design which is both clearly structured at the same time as being prone to risk because of the combination of the following factors: investment in publicly-controlled procedures which rigorously define the socio-technical system accompanied by *accountability* requirements (Chapman, Cooper, & Miller, 2009; Neyland, 2007); the involvement of public actors who can be both advocates of a legal-rational model at the same time as being participants in a politically unstable situation; an economic investment formula based on long-term planning, but for which the profits appear improbable from the outset (on the one hand costly technical

⁵ <http://www.riaed.net/spip.php?article35>

⁶ <http://www.ader.mg/index.php?go=news&id=2>

choices to be made, on the other price-setting at low levels). Even with the initial grants for installation, the price controls operated by government agencies weigh heavily on its medium-term profitability, a situation made worse by unpaid debts (see below). These constraints limit the capacity of entrepreneurs to get involved, especially in the context of the political instability of a country such as Madagascar which makes long-term economic and financial commitments potentially hazardous.

ii. The local level: 'managing the overflows'

Covering every link in this chain of actors, the field studies carried out in Madagascar have thrown light on the forms of organization and of local life which operate around such a decentralized network. They have also afforded a good insight into the so-called 'BoP' populations, as consumers or future consumers of these installations.

The studies carried out in the electrified villages have revealed in a quite striking way the level of investment agreed to by the local operator – either an entrepreneur or a cooperative venture – in the continuous process of adjusting and inventing official or tacit rules, in the managing of interactions with the consumers or more widely with all the 'groups concerned' with the network. The strong socio-technical interdependence between production and consumption calls for constant regulation in order to tackle problems of reliability and availability or to cope with the need for constant adjustment between the electricity supply and the fluctuating demand.

In the village of Antetetzambato, the use of rare natural resources for electrification, in this case the water used for the hydraulic station, has generated periodic shortages for other peripheral economic needs. In a period of drought, the operator finds therefore himself in competition with local agricultural interests for monopoly of use of the water. He then has to suspend operations and deal with tensions with clients over the ensuing constant electricity cuts.

But the opposite can also happen whereby the operator has to face real overflowing of network demand and the consequent difficulty of any rigorous control of production flow. In the case of the electrified villages, there are multiple reasons for overflowing demand, sometimes even drastic overflows, as for example: illegal extensions to the network through unofficial users fixing up makeshift connections to neighbouring houses which are officially supplied; the re-sale of electricity by regular consumers to households around them; the over-consumption by regular fixed-rate users, using equipment over and above that written into the contract; peaks of consumption in the evening when, over a whole village, all the households are watching television or using the radio or DVD players, and who quickly use up the batteries of solar panels; or times of family gatherings or parties when makeshift extensions are used to link several households together, etc. One can also find examples of almost official 'arrangements' made, by some who are concerned with the political relations with non-electrified neighbouring villages: tensions and jealousies between villagers can be partially resolved by the concession of an indirect access to free services offered by electrified households (such as recharging telephones).

One of the principal activities of the operator is therefore playing the role of arbiter to take into account external factors (such as water), to canalise flows and fix the frontiers of the network, controlling uses which very easily go beyond the fixed rules in the contract. These constant

adjustments themselves generate an intensification of the regulatory processes and the work of checking up on the user:

”Do you tell people you are coming to inspect them or do you make surprise visits? It tends to be surprise visits. Because when we visit, it’s not just a question of inspecting the installations but also checking how much power they are using. For example you find some who are using electric irons whereas that is not in the contract” (Head of the Antetetzambato cooperative)

But to the problem of the undisciplined user can generally be added that of the ‘irregular payer’: a monthly bill for electricity charges imposes a time framework which is far remote from the way the money comes in to the household, which is rather on a one-day basis for work done and in any case is extremely irregular for the local population.

« It depends on the circumstances of each consumer and almost all the network heads know the financial situation of each client, and all the clients are aware of this. So the operators can discuss with the client so that they can pay what is owed at the right time, or just a little bit late. The recovery rate of debt is now running at 75% (...) So it [the money] comes in but a little late. They just can’t make it.

- Do you accept staggered payments ?
 - Payments spread out over a period of time, yes we do.
 - And do people sometimes offer you payment in kind, like food crops or something like that, say with their livestock ?
 - With chickens and hens, yes that has happened, but it is the network head who will have to sell them every day. That is arranged between the ‘network head’ and the clients. But not between the cooperative itself and the clients.
-

Depending on the neighbourhood and the lay-out of the houses, the network is managed locally by ‘network operators’ who have the job of providing access to the network, looking after its basic running and collecting consumer payments. These roles cannot be dissociated from the personal relations cultivated by agents recognised locally for their moral authority, relying on their strong political legitimacy in relation to consumers as much as in relation to the local political authorities (always with the lurking threat of embezzlement or other misappropriation). These individuals, as recognized members of the village, combine technical, managerial and social roles: they fulfil a sort of supervisory role concerning the uses made of electricity in favour of local development, counselling for example that the electric light should be used for homework and other household work rather than for television, and also for promoting educative projects (such as a computer room for the school) or for promoting craftwork and other educational and professional uses of electricity. The question has to be asked about the long-term future of the enterprise when such reliable and trustworthy staff are no longer there. The major question therefore remains concerning the long-term (and permanent) future of such an innovatory enterprise.

The network can therefore be seen as a rigid socio-technical *agencement* largely supported by a series of formal operational systems (rational and legal) – norms, legal status, price-setting, etc. – which incorporates both public requirements (ecology, collective service, uniform tariffs) and at the same time a formula for paying off the initial economic investments (subsidies, monopoly). But it is faced with two major difficulties. The first stems from the relative fragility of long-term agreements and formal arrangements as a part of a vaster political system in countries where its

stability is uncertain. The second concerns the fact that this rigid assemblage presupposes a degree of consumer discipline in order to guarantee usage which can meet these requirements and alignments over a long period of time. Faced with consumer volatility (in terms of payments) and the many irregularities at the periphery of the network (fraud, political manoeuvring, etc.), the network can generate institutional re-arrangements of an ad hoc nature as a way of coming to terms with the many necessary adjustments. This can effectively mean a superfluity of control regulations but can also lead to a system of community relations which will constantly provide back-up to this socio-technical system.

2. Exploring individual forms of electrification: a 'liberal' model to ecologize

Starting with the objective of evaluating the social acceptability of the micro-network small power-station solution, the research team in the field wished to find out more about existing practical uses of electricity. This is how they discovered the important role played by individual installations, and particularly the car battery. A real and thriving market exists around the working of this system. Batteries are in massive use for storing and transporting electricity in rural zones where there is no electricity station. They are also to be found in towns as a way of making up for the deficiencies of the national electric grid. They are in fact alternatives to the generator for less well-off households. Investigating the existing market which operates around this form of energy distribution has led Schneider Electric to consider a new form of assemblage which brings together a socio-technical system which is weak and flexible in terms of interdependencies, a chain of micro-entrepreneurs which is informal but relatively stable and economically long-lasting, with instruments of regulation which are essentially trade-based and founded on confidence and professional reputation, the sort of regulation which has nothing to do with – and is also ignored by – the executives and other political actors and investors engaged in electrification programmes. As in the previous case, we propose to follow the chain of action associated with this system, but this time reversing the process: we shall start with the specific uses and practices 'in the field' and then trace back to the intermediaries of the system and only then consider how such a basic system is treated institutionally by government agencies.

i. A stable and flourishing second-hand sector

In Madagascar, the battery mainly found in circulation for domestic use is a so-called 'starting' battery, designed to be used in a road vehicle (car or truck). The socio-technical rationale on which its utilization is based is relatively simple and flexible. Although it is costly and relatively inefficient, it affords a certain autonomy to its users, both through the makeshift do-it-yourself way in which it can be used and the relative contractual freedom that it bestows on those involved.

Linked by a rough contraption of wires to a set of socket outlets, the battery can be used to recharge mobile phones, to listen to music or watch a programme broadcast on the national channel or power a DVD reader connected to a television which is generally black-and-white. Batteries are often used in a sub-optimal fashion, for one piece of equipment. The performance of the battery in this case is quite mediocre: a full battery is used up in about three weeks for a radio and lights. On the technical level, batteries present major drawbacks, notably in terms of restrictions in their use linked to breakdowns and maintenance as well as the question of the

ready availability of the financial means or the time necessary to go to the nearest town to have a battery re-charged. It was noted moreover that, if a household sometimes had the money to make an initial purchase, it did not necessarily have a budget for its regular use and for repairs. Households rarely save up in order to pay for these things, let alone anticipate them in a regular budget. So recharging the battery and thus having access to electricity appears like a luxury to be indulged in occasionally when the occasion, or the money, presents itself. It is not like school expenses or a mobile phone which have to feature as regular items in the family budget. Compared with the micro-network, we can say that there are no dependent relationships causing problems of consumption: when a person does not have the means of paying to re-charge the battery, nobody covers the transaction; there is no debt or recovery of debt to think about.

This does not mean that the market in 'starting' batteries is unorganized. There exist on the market two types of battery: new batteries that can be bought in hardware or DIY shops and second-hand used batteries bought in the market-place or from specialists in re-charging and repairs. These latter can be found for the most part scattered through rural poor neighbourhoods, constituting a stable chain of local micro-entrepreneurs who ensure the circulation, recharging and the maintenance of the products from the time they are imported into Madagascar to their final recycling, when some of the batteries are put to other uses, notably artistic (the battery cases can be repainted and resold as plant tubs). These micro-entrepreneurs generally carry on this business of repairing and recharging batteries together with other second-hand trading such as selling other electrical equipment or tyres. They effectively offer a supply of electricity which is accessible to the poorest both through the multiple forms of recycling practiced and through the relative guarantee of competence and professionalism which the personal links which are at the base of these transactions ensure.

Situated upstream from the urban retail market, the supply of second-hand batteries relies on two completely informal but highly organized chains: the illegal trade in second-hand cars imported from neighbouring countries and also the purchase at low prices of old batteries from local drivers and transport companies. These two flows complement each other. 'Working the import trade' depends on being 'in the know' with well identified trading partners so that the traders can have regular access to a good stock of batteries⁷. The drivers and transport companies represent a smaller source of supply, with drivers either taking the old battery directly to the repair workshop or giving it to door-to-door salesmen who work as middlemen. But in all cases, the forms of transaction (where they take place, the exchange rituals, the way of fixing the price and who gets what) are based on stable rules which are known by all the participants in the trade.

In these transactions, it is the expertise of the re-sale agent in evaluating the state of the merchandise, the nature and the cost of the repair operation, its re-sale potential and its wholesale value, which is the essential factor. The best batteries go on sale just as they are to individuals, some of them need small repairs, and yet others, called 'grafts' are entirely rebuilt from parts taken from old batteries beyond repair. The professionalism of the retail micro-entrepreneur is also in evidence in the exchange with the customer at the end of the chain. Reputation plays a big role in building relations of confidence at the re-sale stage, as in the repair and re-charging of the

⁷ About eight times per year for a supply of 10 to 30 batteries per trader.

batteries. Rarely technically competent themselves, the end customers can judge the quality of the entrepreneur by comparing the durability of the product after a repair or a battery's life-length after a re-charge. It is not only a question of the vendor's reputation; there are other material ways in which the reliability of the purchase can be assessed, giving a relative stability to the market arrangements. In the workshops, the sale prices and recharge prices are clearly displayed, sales are accompanied by a 3 to 6-month guarantee, and the circulation of the batteries to be recharged is rendered secure by a ticket system stating the date, the power of the battery and the name of the client. The depositing and the recovery of a battery for recharge or for repair are accompanied by systematic controls of the state of the product carried out in the presence of the client.⁸ In short, judging the matter as an economic process, the second-hand battery market is a market which relies on interpersonal arrangements with a minimum of contractualization and a maximum of trust.

Flexible, well organized, and reliable for the customer, the second-hand battery market is a permanent fixture and even a flourishing one. The micro-entrepreneurs encountered take calculated advantage of their connection to the national electricity network by integrating this cost in their profitability calculations in which the resale of electricity through their battery recharging service finances an electrical consumption reinvested in new battery repair services and the sale of various sorts of electrical equipment. The accumulation of profit on this initial diversification allows some of them to develop new activities (transport, taxi services, etc.). The second-hand battery market appears as an economic activity with few barriers to competition: several battery-charging entrepreneurs of a certain size and portfolio of activities can easily coexist and can be a springboard to constructing real entrepreneurial take-off careers, so sought after in development initiatives. Surely, the specific properties of this second-hand battery market that we have just described should make them immediately eligible for the ambitious promotion of BoP market initiatives?

⁸ With instruments which are more or less sophisticated depending on the size of the workshop: from a simple electric wire to check the charge level of the battery to measuring tools for acidity and voltage.



Posting up the different prices of recharges according to the battery size



The commercial entrance to a workshop : the used batteries serve to advertise the business



Ticket given to the client when leaving a battery for recharging



Batteries continuously connected for recharging

Document 1: The exchange facilities in the second-hand battery market (Source: Cholez, Trompette)

ii. An invisible market on the periphery of the electricity market

With the use of old batteries being an activity close to the salvage and reclamation sectors, this second-hand market is totally ignored from the point of view of local, national or international authorities. There exist in effect no regulations and political framework around this practice: for one thing, it doesn't need these (with limited investment required and no new infrastructure) and for another, it is not subject to control by outside authorities, in particular concerning the KW/per hour price. Moreover, the very sale of these second-hand batteries upstream in the economic chain has a clandestine side to it: the batteries are hidden in second-hand cars and in tyres on the inside of imported containers. Everything happens as if this underground economy is invisible to the public authorities who are concerned only with regulating new batteries used in road vehicles. This is why there are no statistics to evaluate the real dimensions of this market. This field of activity which we have just described is therefore part of the very developed

informal economy of the country. For those in the field who are involved in the recharging business, or the battery repair business and all the other intermediaries, it is precisely the fact that they escape economic control and regulations which makes this field of activity an attractive one. Those battery rechargers that we met do not want to make official declarations concerning their activity and accept a legal framework for their practices, arguing that this would have an automatic knock-on effect on prices.

In spite of its technical weakness and the relatively high cost of functioning in terms of supply of electricity, the battery is used on a massive scale and its market is well developed. It reflects a market which is much more directly adjusted to the forms of material life of the BoP populations: on the one hand an economic supply coming from minor local commerce sources (rechargers, repairers) and on the other hand consumers, if not 'the poor' (Cholez et al., 2010), whose money income is scarce and irregular and who are only concerned with short-term expenditure. The second-hand car battery recharged in the same sector with only short distances involved would thus seem to be an extreme form of an economically liberal logic of gaining access to electricity. But compared with the localised power-station presented above, the battery is an individual solution of little ecological value: expensive, with a short lifespan, of suboptimal use (poor battery use damages the re-charging potential) and polluting, with dead batteries littering the streets and houses of the villages.

How does Schneider Electric plan to get involved? Interested in the opportunity that such an existing market presents in terms of putting down local roots, the company remains nonetheless circumspect as to the manner in which it can be associated with such BoP innovative projects. There are plenty of 'technical' paths which could be followed up. But on the other hand, in designing a possible assemblage around an innovation plan in this area, the virtual absence of political concern and in particular of macro-actors with institutional back-up would appear as a weakness in such a project. One idea is therefore to join this market by adding a few elements to the existing assemblage (a technical device to the battery) to optimize and ensure a better re-charge and subsequent use. The development of this technical advance would be accompanied by a support for the 'battery sector' through training programmes, an increase in battery rental points, and forming partnerships with local entrepreneurs in a better position to invest in inexpensive solutions. Village micro-entrepreneurs and medium-sized enterprises are the key-players in a project which could be thought of as a form of 'ecologization' of a local market. Its widespread practice is therefore a good indicator of territories which are only weakly institutionalized, spaces on the periphery. But this strength is also its principal limitation: the essential question for Schneider Electric is promoting its visibility.

The conception of a new assemblage based on the battery and its network of local micro-entrepreneurs amounts to a very different market design than that first envisaged by the company: it places great emphasis on strong autonomy compared with institutionalized macro-actors, but is nonetheless of much more direct interest to the BoP considered both as micro-entrepreneurs as well as consumers. At the same time, it exposes the company to much criticism concerning strong external factors such as pollution and could thus require considerable investment and monitoring (training, close control of recharging operations, etc.) in order to reduce these externalities and satisfy the accountability requirements which would be demanded

by the many institutional macro-actors. Ecologized, regulated, controlled, even subsidized, the battery energy system could receive its institutional authorization but its 'civilizing' character is not without a question mark.

Discussion

The BoP vision was built as a business strategy (for corporations and consumers), free from any political concern. Our study shows that, in BoP projects as well as in others business activities, corporations are involved in political issues of citizenship in different ways. First, designing an offer dedicated to the poor, corporations *take part in the political deliberation* of the countries and of the international institutions: they participate in the classification of populations, the qualification of poverty, the definition of the poor's needs and the best way to address them. Secondly, corporations are involved in *governing citizenship* when they position themselves as providing people with their basic needs (food, water, energy, etc.), especially in some contexts where there is a lack of local governance and public infrastructures.

The examination of the political role of corporations in the design of BoP market extends the reflection about Corporate Citizenship in two respects: a) the management of the overflow issues associated with the handling of public services; b) the complex equation to be solved concerning the making of an accountability (depending as it does on the type of public concerned). Accountability and overflows and with them the way of framing, defining and involving the BoP consumer, constitutes the critical points around which the essential arbitration between the two separate paths takes place. In the first case, the company substitutes for the government in providing a public service, hence setting out a visible and bureaucratic accountability. But this supposes a high issue of framing the overflows (Callon, 1998), as witness the numerous social arrangements around the power station. Does the corporation have the skills and resources to manage locally the political regulation of a public service? Does it have the legitimacy to assume this role? Such a requirement disappears in the second case. Here the corporation answers to societal expectations with a product 'plugged in' to existing markets and consumer practices. Affordability and frugality are properties which are incorporate in the sociotechnical device itself and in its use. It releases the corporation from the management of overflows. However, this solution opens up questions concerning its more invisible and controversial accountability.

By following innovative process in the development of BoP markets, we observe that the same problematization (in this case energy shortage for rural poor people) can open up to a plurality of market designs, around socio-technical assemblages which are distinct in their basic properties. These market designs relate to very different configurations of actors, and these actors do not carry the same weight in the regulation game, in making themselves heard and asserting their conception of what is at stake for them and/or a matter of political concern.

The first solution, associated with the setting up of local electricity stations, can be qualified as an 'institutionalized technical solution'. As a responsible ecological solution satisfying international norms, both ecological and economic, it is eligible for financial and political support. In their formal dimension, the framing of national governments and international organisations reflects a

system of exchange between economic and juridical resources (monopoly, finances) and the satisfaction of ecological and social needs. The market design here operates in a space dominated by a rational-legal legitimacy, which is structured around public involvement, economic planning and a legal framework. The assemblage requires a high institutional investment to justify long-term financial calculations (investment and amortization) and technical choices (renewable energy, capacity restriction). The benefits for the Company (Schneider Electric) are much of a moral order: it can assert itself as a fully-fledged actor in the fight against energy shortages in developing countries and gain in social legitimacy in environments which are more sensitive to demands for responsibility (Fourcade & Kieran, 2007). In a way, institutionalised technical involvement represents a visible and direct accountability (Boström & Garsten, 2008; Neyland, 2007) that could be qualified as a 'rational-legal accountability'.

The second path reveals opposite properties: at the margins of the institutional market, it offers a technical arrangement, which is deprived of institutional links (norms, taxes, price-setting, etc.). Its quasi-invisibility attaches itself imperceptibly to existing informal markets. Being part of an informal economy, it is better described as an 'economic circuit', in the sense advanced by V. Zelizer (Zelizer, 2004), meaning incorporating unwritten conventions for evaluating goods, regulating transactions based on social networks operating their own circulation of goods and information, etc. without necessarily requiring formal institutional frameworks for regulating exchanges. The limitation of such a solution is that it remains sub-optimal on the ecological level, except in so far as further investment would perceptibly reduce its polluting effects (through enhanced training and product refinement to meet ecological requirements, normalization of the second-hand battery market, etc.). In this case, the multinational company provides incentives and plays a supportive and facilitative role by grafting innovations on this local economic circuit, based on interpersonal arrangements and entrepreneurship. The assemblage conforms to the BoP vision, notably because it supports an existing value chain. But its polluting effects and its informal (even quasi-illegal) circuit hinder the construction of the firm's visibility as a moral actor. To make such a solution accountable in the arena of development programmes requires a host of investments in 'translations', 'interpretations', calculation and the making of equivalence (MacKenzie 2009).

These two solutions also reveal variations in the corporation managing of overflows. Through the concept of a 'civilizing market', M. Callon suggests that the market capacity to take on political issues (such as sustainable development) requires taking into account externalities and the 'concerned' groups which appear all long the experimentation. How do these innovation projects taken up by a multinational company and adopted within a BoP market perspective rise to the ambitious challenge of a civilizing market?

The experiment based on the power-station brings up two kinds of overflows issues. On the one hand, as part of a vast political and social system, its stability is far from being assured, either on the institutional level (political instability, with the fragile legitimacy of governments) or on the economic level (its long-term profitability). Local political uncertainties hamper the corporation's involvement despite the significant political gains in terms of social legitimacy. On the other hand, it entails the (re-)invention of numerous supplementary institutional back-up supports to manage the multiple overflows which result from its rigid framing. Notably, it requires a high

level of consumer normalization and disciplining in its use (Von Schnitzler 2008) as in the economic requirements. The corporation has to create morally legitimate uses and economic habits, which can incorporate relatively restricted definitions of the 'right way of consuming'. That presupposes defining the consumption needs of the poorest people which consuming values appear remote from western consumer models.

Concerning the second market option, the promotion of battery use fits in much more directly with BoP business model strategies: a low-cost product, a scattered entrepreneurial force, informal local markets and local cultural habits. It is free from the constraints that weigh on the world energy market and epitomizes a chain of transactions based on a relative economic and technical flexibility attuned to the material ways of living of the BoP populations. Moreover, it is totally aligned to BoP consumer requirements, including its labile use, the volatile capacity of consumer payment, its adaptability to multi-functions, and especially to collective leisure use (TV, music). The design of this market favours 'plugging in' (literally as well as metaphorically) to this existing economic circuit by enrolling its stakeholders. The whole question remains here nonetheless whether this system has the capacity to incorporate the environmental dimension, that is to say whether this volatile and informal but also extremely polluting system can be ecologized.

Conclusion

Working with the theory going by the same name, BoP market design could be directly linked with the enterprise of civilizing markets, a phrase also used for hybrid coordinating structures but in this case recognizing other 'piloting' participants, such as the multi-national companies. The challenge of the BoP is that of claiming that the market can constitute a lever for social and economic inclusion, which is more powerful than development programmes. But treating BoP experimentation as a place where alternative market design forms can be explored highlights the tensions which are implicit in these grand globalizing concepts: should we be promoting and supporting a 'rational-legal civilization' based on administered markets which as a consequence incorporate governmental concerns for ecology and equity? Or should we be centring our help on existing but informal markets, which are resolutely anchored in local social configurations? We are concerned with what is 'accountable' for the governmental and international political organizations - but does this accountability also apply to the BoP consumer? Should we be civilizing the undisciplined consumers or ecologizing the informal economies where the potential mechanism exists for the economic and social inclusion of the poor populations?

Behind all this lies the question of the very process of civilizing markets, and once it is recognized that we are talking about mass markets targeting several billions of the world's poor, this primordial question now reveals a major tension: should the 'civilizing virtues' be confided to politics and rational instruments to control and influence economic interaction and the forms of mass consumption; or should we recognize that the democratic taking into account of the multiplicity of the 'voices' involved in the market, and in particular those of the weakest, those at the bottom of the pyramid, can challenge our initial definition of what constitutes the 'common

good? This opens up to stimulating exchanges about the multiplicity of the ways in which a corporation can be both citizen and accountable.

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