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The Renewable Energy's Development Line: Balancing market/government and community interests

By Dr. Loraima Jaramillo- Nieves[1]

Abstract

To contribute to the understanding of Renewable Energy's (RE) Development, this work makes three points about "RE's development line". First, development based essentially on the Market/Government (DMG) model is characterized by a good planning structure and rigid processes originating from the top-down. Second, Development based on the Community (DC) is a less common, more flexible, and open model. The examination of DMG and DC reveals the differences in the approaches of the type of projects promoted by various groups or individuals and how those groups/individuals might come to oppose each other. Third, the discussion reveals the conflicts that may arise between marginal private gains promoted mainly by the government and the marginal social cost. From this analysis and considering the best aspects of DMG and DC a third model is proposed; the Hybrid.

Keywords: Development, Renewable Energy, Framing-Overflowing

Introduction

The moment energy utilities used fossil fuel to satisfy demand the human race was destined to find a substitute for this source due to its exhaustible nature. An alternative to polluting energy sources has been requested from various sectors of society. That is why it is understood that Renewable Energies (RE) are a prime necessity for the sustainable future of the world (IPCC, 2007). The deployment of this technology is a fertile ground for investment. Currently, there are market and political conditions, like international agreements for greenhouse gasses emission reduction and technological innovation advances, which make more viable RE projects.

Rapid growth, particularly in the power sector, is driven by several factors, including the improving cost-competitiveness of renewable technologies, dedicated policy initiatives, better access to financing, energy security and environmental concerns, growing demand for energy in developing and emerging economies, and the need for access to modern energy. (REN21, 2016). With this conditions, these technologies are feasible even in developing countries where by 2016, RE make up 61% of deployment in non-OECD[2] economies. (Henbest et al., 2016) In the global panorama, an estimated 147 gigawatts of RE power capacity was added in 2015, the largest annual increase ever (REN21, 2016). The tendency of generation from renewable sources is expected to keep growing. The World Energy Outlook, 2015

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forecast that consumption of marketed RE increases by about 3.6 quadrillion BTU in the reference case[3], from 9.0 quadrillion Btu in 2013 to 12.5 quadrillion Btu in 2040, the electric power sector will be responsible for most of this growth. (EIA, 2015) Even though the REs seems to be the best environmental choice, an accelerated deployment of this technologies that does not include all the elements that affect may lead to other difficulties.

Taking into consideration, the scope of the global RE deployment, the diverse social, economic, environmental, and political issues involved, a successful implementation of RE technologies requires the correct approach.

Literature review

Previous studies focused on different strategies for implementing RE or on analysis of the development and commercialization of renewable energy. The diversity of perspectives for previous research is broad, a complitarion of the most relevant research from recent years are reviewed here. Del Río (2009) explain the particularities of the Spanish promotion system of renewable energy sources in the European context. Masini & Menichetti (2010) sought to fill the knowledge gap of the lack of emphasis on the preferences of investors, shedding light on the process in which investors distribute capital among renewable energy projects. Barradale (2010) conducted a study exploring how the public policy uncertainty discourages investments. Aguilar (2010) identified the factor linked to investment preferences in RE using a stated-preference investment allocation instrument. Liao (2011) proposed how to provide a market-driven approach to remove barriers and achieve dramatic development of sustainable energy market. Another research explores three different policies that had have been utilized to encourage investment in renewable energy sources: renewable portfolio standards, a carbon tax, and tax credits for the renewable generation (Arnette & Zobel, 2011).

The objectives, origins and development of community energy in the UK was examined by Seyfang et al. (2013). The role of the renewable portfolio in the US energy action plan during 2010-2030 was discussed by Aslini & Wong (2014). Other investigations using case study approach to examine what is happening at the local community level towards realizing ambitions sustainable energy or zero carbon emissions, among others goals, form a social perspective (Van der Schoor, 2015). One of the most recent research presented as a modern development to re-organize local energy systems to integrate distributed energy resources and engage local communities. (Prasad et. al 2016)

However, it has been found that many prior studies that focus on RE development, despite its standpoint as a variety of technologies, scenarios, disciplines, and specific conditions; did not give relevance to the fact that the way in which RE development is managed varies from

[3] Reference case: The AEO2015 Reference case projection is a business-as-usual trend estimate, given known technology and technological and demographic trends.

one project to another. There are different scales at which RE technologies can be implemented, from small local off-grid application to major installations supplying the electricity needs of tens of thousands of household (Walker, 2007). The differences between projects are rooted in the entity that gives rise to the project. The literature also lacks a deep analysis of how the market/government and community shape the RE development. RE projects may lead to clashes between key stakeholders.

In RE deployment, energy policy, economic incentives, and private investments (Welch, 2009) merge with social acceptance (Carlman, 1982), justice, and community fairness (Gross, 2007), but the latter three factors are rarely given the same importance thus creating a breach between the institutional (Market/Government) and the social (Communities) arena. This work offers a simplified approach for viewing RE development, an approach that is centered on the RE development, and how it is widely by the Market/Government or the community[4]whether RE development is Market/Government or Community based. The aim is to provide an overview of this emerging division in renewable energy by defining two types of development approaches. One is the "business-as-usual" commonly observed in commercial projects financed by the private sector and promoted by the government (Development based on Market/Government or DMG) and other a smaller scale project originated by a group of citizens or organizations with a common objective to create an RE project for the community's benefit. (Development based on Community or DC). Taking the best elements of RE development approaches, this paper propose a third: the hybrid model. At the same time, this article assesses the conflicts that may arise between what Callon (1998) called the "private marginal" promoted primarily by governments and the "marginal social costs" as seen by communities.

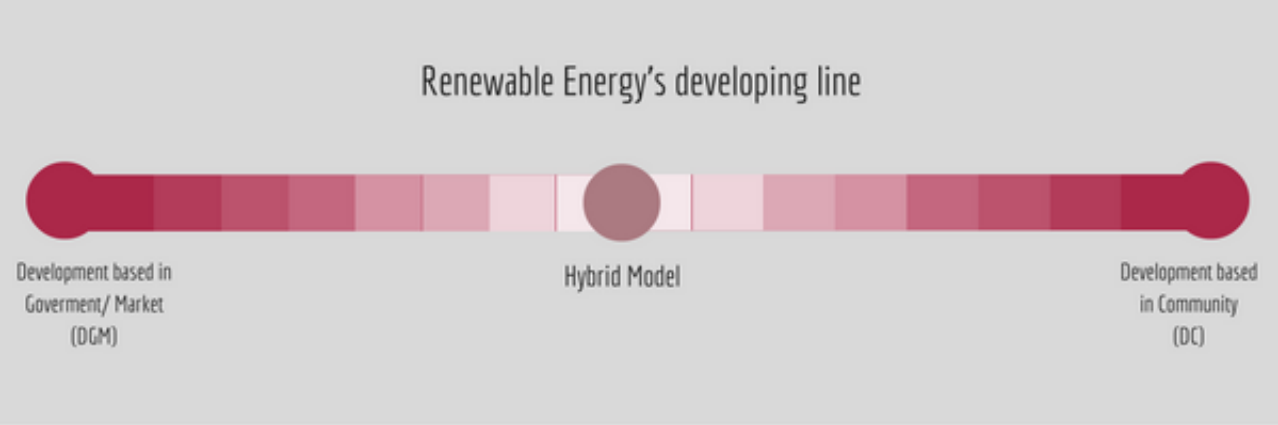
The remainder of this article is organized as follows. Section two introduces the concept of an RE development line as well as development based on the Market/Government approach and development based on the Community approach. The distinctive elements of both models are provided in Section Three. The Hybrid Model is presented in Section four. Finally, how the three models merge appears in section five.

RE's Development Line

This article proposes, based on previous works, that an approach used for the development of an RE project could be positioned at a point on an imaginary horizontal line (lets call it "RE's development line") between two poles, one representing a Market/Government-based development, and the other representing a community-based development.

[4] Community is defined in this work as "a set of people who are brought together by choice or force of circumstance, and who have learned to live, work and play together'' (Gross, 2007).

Figure 1: RE's development line



The pole on the left represents the "business-as-usual" commonly observed in commercial projects financed by the private sector and promoted by the government (Development based on Market/Government or DMG). The pole on the right represents a smaller scale project originated by a group of citizens or organizations with a common objective to create an RE project for the community's benefit. (Development based on Community or DC). The involvement level of these groups in the projects may vary from case to case (Walker, 2008).

An examination of DMG and DC reveals the differences in the approach of the type of projects promoted by various groups or individuals and how those groups might come to oppose each other.

Both DMG and DC approach to project development has their advantages. DMG builds a development structure and organization based on legal policies and institutional resources and on principles that have been used and modified over an extended period with the intent of making RE development efficient. The relationship between policies and RE deployment seems to be positive. Previous studies show that the growth of RE capacity is positively relevant to the growth of RE policy adoptions; the more RE policies countries adopt, the more RE capacity countries can achieve (Liao, et al. 2011). This approach is characterized by a high level of institutionalization and central control. These centralized systems have provided the potential for efficient resource allocation and generate substantial economies of scale in the process of building and operating very reliable energy transportation and conversion plant (Bouffard & Kirschen, 2008).

At the other side of the RE's development line, DC could enhance the experience and the results of technology implementation. The DC approach can improve the livelihood of the community, without depleting natural resources at the same time improve resilience (Walton, 2012). Moreover, it can contribute to increasing understanding of and support for renewable energy investments (Schweizer-Ries, 2008).

DC approach is more frequent in UK and Netherlands were the community energy projects are supported by the government. In other cases, the project is created as a partnership with the private sector as is the case of Neilson Community Wind Farm in Scotland.[5] The literature does not offer an explicit definition of RE development based on community, instead, mention a wide variety of community energy definitions. One of interpretation was provided by Seyfarg (20013) who defined community energy as a project that encompasses a broad range of initiatives such as locally-owned renewable energy generation, community hall refurbishments, collective behavior change programs, and so on, and are claimed to bring additional public engagement benefits to top-down policy initiatives. United Kingdom government define community energy projects as projects that have an emphasis on local engagement, local leadership and control and the local community benefiting collectively from the outcomes. The trinational Commission for Environmental Cooperation (Canada, Mexico and United States) defined Community renewable energy as locally owned, locally sited renewable energy (electricity and/or heat). For Walker (2008) Community energy systems refers to electricity and/or heat production on small, local scale that may be governed by or for local people or otherwise can provide them with direct beneficial outcomes.

The structure of community development may vary. Walker (2008) explained that project could be 100% community owned, or may be developed under co-ownership arrangements with the private sector. Projects can also involve the ownership and financing of energy production that is fed into the grid rather than being used locally. The models of ownership that have been adopted before are cooperatives, community charities, development trust and shares owned by a local community organization (Walker, 2008).

Community groups can help tackle climate change, develop community energy and transport projects, help minimize waste, improve the quality of the local environment, and promote fair trade and sustainable consumption and production (HM Government, 2005, p.27). Community RE could be constructed as providing a generic solution for public opposition to a wind farm, rural regeneration, capital investment and the stimulation of small scale RE market" (Walker, 2007). In the case of UK, this RE development approach emerged as rationale which saw the community approach as a way of overcoming a key perceived obstacle to the diffusion of renewable energy technologies. (Walker, 2007)

Hielscher et al. (2013) (cited in Seyfarg, 2013) identified three aspects of community energy which differentiate the sector from government- or business-led interventions. First, community energy projects are multi-faceted, and rarely address only one technology or aspects of behavior in insolation. Second, by bringing together groups of people with common purpose, they overcome the structural limitations of individualistic measures. Third, they enable citizen participation in addressing sustainable energy issues, building on local knowledge and networks, and developing solutions appropriate to local contexts.

As will be discussed in more detail in Section 3, both development models have some limitations. An entirely DC-based approach is

[5] http://www.neilstonwindfarm.org/

not economically or strategically feasible for all projects. DGM-based, development tends to evoke public rejection of RE. DMG and DC may represent a dispute between national needs and local quality of life. The public opposition may appear despise public support for the development of renewables (Social Gap) and may be caused by inadequate public consultation process by developers (Walker, 2007). A broader explanation for public opposition is the absence in procedural justices, distributive justice or trust (Community Acceptance) (Wüstenhagen et al. 2007).

Thus, as discussed below, the differences in the DMG and DC approaches lead to the need for a third option that represents a good balance between the interest of the market/government and community.

Distinctive elements

As presented in Table1, DMG and DC differ about the (1) fundamental idea of gathering from key actors' (government, market and community) visions of the norms and exceptions of the development process, (2) the flow of decisions that determine the development process, (3) the action model for project implementation, (4) the vision of the developer-stakeholder relationship, and (5) the identification of the corrective instruments to overcome an impasse. Everything that leaves the frame pre-established by those responsible for making decisions from above. According to DC, an inevitable "byproduct" of framing.

Table 1: DMG/DC Distinctive elements.

	Development based on Market/Government	**Development based on Community**
Fundamental idea	Framing is the norm; overflow is a flaw	Overflow is the norm, framing is costly and always imperfect
Flow of Decisions	Top-down	Bottom-up
Action Model	Decide-announce-defend	Consult-consider-modify-proceed
Vision of the relation to stakeholders	Confrontation is inevitable	Collaboration is indispensable
Corrective instruments	Nimby Bill	Community renewable energy

Fundamental idea

In The Laws of The Markets, Callon (1998) used the concept of framing and overflow, initially suggested by Goffman (1971), to explain from a sociological point of view the dynamic of markets and economic externalities. As Goffman (1971) explained, the framing and overflow concepts are useful in understanding the complications that arise in the process of creating something (in this case an RE project) and in identifying correct procedures as well as unacceptable elements, as seen from stakeholders' perspectives (Investor/ Government or Community). Understanding framing and overflow assists in identifying participants in the planning and developing process and in determining how various opinions and concerns are addressed, and, finally, how the project is modified. Framing is the process through which a common world is established between different actors that allow them to achieve a collective scenario of the desired outcome (Jolivet & Heiskanen, 2010). It implies normalization of conduct with the aim of obtaining a common objective for all participants and is controlled primarily by government and market. The framing is predominant, while overflows are emergencies that must be contained with the help of the appropriate devices (Czarniawska, 2014). Etman (1993) defined framing as the selection process of some aspects of a perceived reality and making them more salient in a communication text, in such a way as to promote a problem definition, causal interpretation, moral evaluation and/or treatment. Entman also indicated that frames, do three things: (1) defines problems (determine what a causal agent is doing with what costs and benefits, usually measured in terms of common cultural values) (2) diagnose causes (identify the forces creating the problem) and (3) make moral judgments (evaluate causal agents and their effects; and suggests remedies.)

In the RE frame concept used by DMG, the main actors from the market and government conceptualize their ideal RE development. In this exercise, they tend to create norms to establish limits for the community's and other stakeholders' needs, claims and participation. The norms that govern framing are fallible because they are highly rigid and difficult to adjust to the diversity of elements, realities, and actors that the frame intends to encompass. Consequently, any person whose conception of the order is different from that established by the frame must try to influence what is already established.

In contrast, the DC model recognizes the impossibility of creating a perfect framing process and proposes a concept of order that permits the identification and inclusion of those excluded based on their beliefs prior to or during the framing. Overflowing may be defined as world views that desert the frame pre-established by those responsible for making top-down decisions. According to DC, an inevitable "byproduct" of framing. Czarniawska (2014) explain that this notion assumes that overflowing is the rule, while framing if continually attempted, is a rare, expensive, and a temporary situation.

Within the planning and development process, where discrepancies emerge due to the impossibility of creating a perfect process[6], certain actors that failed to meet the expectations are identified by framing creators and themselves. This is followed by an auto-inclusion of actors who were excluded and who carry their perspective of framing and express their views. It is here, in the arena of public opposition that the overflow of the planning and development process can be seen. In the context of the DC model, overflow represents, not the failure of the process, but the unavoidable instability and imperfection of the development process and represents the possibility of improvement of the process.

According to Jolivet & Heiskanen, the combination of framing and overflow is sometimes conceived as the process of participation based on the analysis of the power relations and controversies. Beyond its conceptualization, the framing theory is also functional because it creates a reality through the arrangement and materialization of the frame maker's concepts. In their studies of the development of wind energy, Jolivet's & Heiskanen's explanation of framing and overflow indicates that developers' and policy makers' mechanisms of framing are used to calculate, predict, and constrain human behavior and materials according to an established plan.

RE development based on market/government designates framing as the norm and overflows as exceptions. Incidents outside the frame must be contained and channeled with the help of appropriate investments. According to the DMG model, overflows are explained and dismissed according to the following reasoning: (1) the majority of the public supports RE, (2) opposition to RE is, therefore, deviant and (3) opponents are ignorant or misinformed (Aitken, 2010 b).

In contrast, according to the DC model, overflow is taken as the norm and framing is perceived as being a rare and costly accomplishment since the investment required to achieve a perfect framing is substantial. In addition, in the DC model, overflows emerge because of the perception that the administrative process that framing creates is rarely concerned for the communal well-being and tends to impose government and market interests that are not always in harmony with those of the community. In the DC model, when institutions are faced with the conflicting interests of the community, they do not write off opposition simply as a mistake. To resolve the conflict, developers should adjust the project's elements that represent an impediment to community acceptance; it is understood that a "community friendly" style approach have potential benefits (Toke, 2005). Despite the apparent discrepancy between the market and government's framing and the community's overflows of disagreement, both concepts –framing and overflow- are codependent. One of Callon's most significant contributions to this discussion is his explanation of the framing-overflowing relationship. As he explains, framing incites overflows. The elements that compose framing contribute to creating the structure and directing interactions that lead to overflow. Owens (2005) agrees, stating that "local resistance to specific proposals generates an

[6] In this context, the perfection of the method does not subscribe to the satisfaction of necessities that originate the development process, but to the satisfaction of the desire of the individuals that are involved in the process. The process is not perfect since the overflows will always exist. Stakeholders unsatisfied by any aspect of the project are always identified.

institutional platform for and is in turn reinforced by, a more generic challenge to the prevailing norms of policy; what is seen, therefore, is a process of interdependence between critique of policy on the one hand and resistance to its localized manifestations on the other."

Flow of decisions

RE project is driven by decisions made by a select group of people. According to the literature, decision making is either top-down or bottom-up (Matland, 1995). Top-down refers to the decision flow that stems from the central government through policies and laws. Decisions are generally made based on analysis of studies and reports from experts requested by decision makers.

Top-down decision making in RE development is also based on or specified by regulations and/or legislation that will guarantee the installation and use of RE sources (Schweizer-Rise, 2008). This decision flow is characterized by the absence of coordination or consultation with agents external to governments and professional elites. Top-down planning and decision making is used in the technocratic- hierarchical style of planning and is characterized by centralized decisions (Wolsink, 2003). Such decision making provides an excellent technical and organized foundation. The nowadays centralized energy system, a top-down architecture, is partially due to the presence of economies of scale, possibilities to ship conventional fuels such as coal and gas to desired location etc. (Koirala, 2016). The efficiency of this type of decision-flow in creating the conditions for acceptance and confidence is questioned (Wüstenhagen, 2007). Even though its economic benefits for investors, the top-down decisions do not always reflect the local reality of the site where RE projects take place.

Bottom-up decision making refers to decision flow that emerges from individuals' voluntary support and networking within a community to develop an energy project (Schweizer-Rise, 2008). This kind of decision making appears from NGOs or group of residents. Changes in utility business models bring opportunities for communities and others social groups to take control of portions of the sector. With the rise of distributed generation, individuals and communities have higher control of generations and consumption of RE (Koirala, 2016). To the extent that citizens are taking over the system, they can gain ground in decision making. Bottom-up decisions are infrequent in the traditional development of REs, and generally, the approach is used for low scale projects. In England, for example, bottom-up decisions for projects can originate from community-based initiatives, as in the case of "Communities Energy Initiatives" (CE, 2010) (Walker, 2008). This new role for local communities is emerging, transitioning them from passive consumers to active prosumers with local generation, demand response and energy efficiency measures (Koirala et al. 2016). The group of residents who initiate the project may be an informal collection of like-minded individuals wishing to start something in their community; or they may be part of well-established, constituted

organizations linked to a community facility such as a village hall or community center (CES, 2009).

Both top-down and bottom-up decision making have advantages. The application and degree of influence of each one of the development process depend on the particularities of the project and its surroundings. Top-down provides a more sophisticated and formal structure, such as, for example, laws that facilitate development and economic instruments that make a project more viable. Top-down decision making is favorable to private investors who require a certain degree of security for their investment. Considering the actual economic climate and the substantial investment and risk that RE projects entail, RE projects must produce the highest and most stable returns possible (Liebreich, 2005). Bottom-up secures the inclusion of the community since it emerges from it. With this level of community's participation, the possibility of finding collaborators exceeds those of finding objectors. In addition, individuals may have the opportunity to learn more about the technology, and this may influence in a positive way community acceptance of future projects. The sense of community belonging may be enhanced.

Action Model

The basis of the project development model, the decision-making process, and the project priorities determine and shape the action model to be used in projects. One of two action models is used: Decide-Announce-Defend (DAD) and Consult-Consider-Modify-Proceed (CCMP). The self-explanatory DAD action model is used by market-based RE development. It is characterized by top-down decisions and its supports mainly investors rather than community members. As a result, the possibility of inclusion of individuals is unlikely, and the opportunity to influence the process and the result are nearly always insignificant. Excluded stakeholders are offended, and this, in turn, is detrimental to achieving the RE development goals and threatens social cohesiveness (Wolsink, 2010).

Excluded from the DAD action model, some individuals have just one role, generally that of reacting in a negative way. Mumford (2010) noted that when a group of people finds themselves threatened by events that are out of their control they activate their defense mechanisms. Thus, it may be understood that the DAD action model causes local opposition to RE development. As an example, Pepermans (2013) point out how social, spatial and social distances affect the acceptability of wind farms in Flanders, Belgium. In his study, he found that a decrease in the social distance through building confidence between the community, protest groups, the local council, government authorities and wind developers is hard to achieve in the ‘decide-announce-defend ' model.

The second action model is Consult-Consider-Modify-Proceed (CCMP), a model that is more consistent with joint RE development. It is a collaborative and more open model than DAD and reflects flexibility to adjust to the claims of

the objectors[7] and to integrate them into the process. Bell (2005) advocates this type of action model, stating “an intelligent developer can recognize that there are good reasons to involve the interested parties in the siting process from the beginning to ensure that stakeholder's decisions do not confront opposition in the future." Halliday (1993) also endorsed this type of model, noting that that CCMP seems to be more successful than the DAD.

Vision of the relationship to stakeholder

The way actors interact and work with each other in an RE project varies depending on the opinions and importance given to the stakeholders. The fundamental difference between the two types of development lies in the choice between confrontation and collaboration during the process. The stakeholders could be collaborators who are working toward a common goal or overcoming hindrances.

Because the framing concept and its accompanying process are imperfect, overflows are exceptions but also expected. Inevitable confrontation emerges from the presumptions of RE's efficiency held by those at the top of the traditional hierarchical development process who reject any arguments contradicting it. Moreover, as the project development process has imperfections, confrontation is always present. This notion is typical of the DMG model and contrasts with the communal model that asserts that collaboration is indispensable in the design, construction, and operations of RE development. This approach is essential for the action model CCMP.

With collaborative planning, the concept of a competitive negotiation is modified to include the creation of consensus, recognition of the importance of every stakeholder, and the value of diverse interests (Bell, 2005). In this approach, integration and conciliation are prominent and go beyond mere consultation. For example, during the project’s development phase of evaluating the consequences of human actions on the environment, discussions should go beyond the mere technical rationalization of a project to include specific social issues of the location where the project will be established (Owens, 2004).

The most remarkable facet of this vision is the understanding that collaboration is indispensable and implies the interdependency of developers, policy makers, government agencies, and community members, including objectors and the silent majority

Corrective instruments

[7] Now, here is an essential point to bring to attention. Objectors should not be seen as individuals with intransigent points of view because objection generally is conditioned (Bell, 2005), meaning that most RE projects have their good and not so good aspects that could be improved in order to gain community acceptance.

Almost every RE project should overcome conflicts. In the case of wind energy, Ellis et al. mentioned that the key issues facing are not "objective" policy blockages, but clashes of values to governance, technology landscape aesthetics, issues of participation and power inequalities." By 1990, developers had experienced intense opposition from communities objecting to the proposed development of wind turbines in a valued landscape (Walker, 2005).

To overcome conflicts, two types of corrective instruments are created and implemented. One consists of laws, regulations, or policies, and the other consists of education of the public. Political tools such as laws, regulations, or bills may be created to foster RE development but also may limit the influence of those who object to RE projects. A classic example is the Netherlands NIMBY Bill. This 1993 top-down bill severely restricts the power of residents, organizations, and local authorities in the decision-making, construction, and design of facilities. It also shortens the discussion period (Wolsink, 1994). The bill grants national and providential governments the power to require municipalities to alter local plans to fit land use requirements and forces decisions concerning installations with low acceptance such as landfills, service centers for indigents, and wind farms (Breukers, 2006). The reasoning behind this bill is that local opposition to certain facilities reflects a lack of commitment to the common interest (Wolsink, 1994). When the Nimby Bill was introduced, it faced heavy criticism because it was in sharp contrast to The Netherland's prevailing planning practice and thus, was lacerating the cooperative "climate". Wolsink (2003) mentioned that "the only attempt to employ the Nimby procedure failed in 2000".

Very like the NIMBY Bill is the 2010 PR Law 161, Puerto Rico Permits Process Reform Law. The purpose of this law is to improve Puerto Rico's economic competence in the international market. To obtain this goal, the process of approving permits is accelerated by limiting the period of consultation with citizens. The law limits citizen's eligibility to express their opinion; only those individuals who live next to the project are included in the discussion.

The effectiveness of this kind of instrument to quiet the opposition is questioned. Prior experiences in other countries show those who are excluded from the decision-making process will always find new ways to make their opinion heard (Bell, 2005).

Corrective instruments such as the NIMBY Bill or the Puerto Rico Permits Process Reform Law limits citizens' participation, but market/government based RE development projects need not be that way. After all, enterprises need citizens' support, and politicians require citizens' votes to be re-elected. For these reasons, government agencies and officials employ another mechanism that is likely more persuasive and less prone to promoting conflict: education.

As Bell (2005) explained, if it is understood that objections to renewable projects are founded on disinformation, the objectors' perceptions should be corrected. If objectors are not going to be excluded, the next step could be educating them with the intention of changing their minds. Although precise and impartial information can contribute to the RE development process because it helps the developer gain community trust. However, there is no evidence linking education with a higher social acceptance of proposed projects (Ellis, 2007). This is because the final opinion of the objectors is formulated

from their personal values that lie beyond the information provided by government and developers.

In contrast to the corrective instrument of the DMG model, the corrective instrument of DC is the insertion of RE development in the local context in the most holistic way by focusing on the local community needs and concerns. Some studies found that people may be inclined to accept an RE project if they are actively involve (Hain et al. 2005) (Roders, 2008). It is also assumed that the participation experience may increase individuals' understanding of sustainable energy issues, leading to their acceptance of other renewable energy developments, including large-scale projects, and more active consumption of renewable energy e.g. switching to green electricity tariffs or installation of domestic renewables (Roher, 2008). In the development of wind energy, for example, the DC seeks to return to the original integration of wind energy and the local setting before the latter's connection to the electrical power grid, a low scale use focused on the local community and harmonious with daily activities.

Some characteristics of the DC Model could be incorporated into projects based on the market/government model. For example, the community could own turbines (Jobert, 2007). Local universities may collaborate with the environmental studies, and local businesses may provide maintenance service or products or serve as service or product providers.

Hybrid model proposed

It may be understood that the DMG and DC types of development are mutually exclusive, but, as implied in the prior discussion, that is not necessarily the case. The market and the government need communities to develop the RE industry, and communities need institutions that promote RE. Many elements of the models are complementary, and both models would benefit by capitalizing on the strengths of the other. For example, it is impossible to conceptualize framing without the concept of overflowing. Similarly, it's hard to conceptualize confrontation without a notion of collaboration. The question now is: "How can the best elements of each approach be capitalized to gain an optimal approach?"

The DMG approach prevails worldwide. The big corporations hold the innovative advances, the organizational structure, and the economic resources to make real the projected RE development. At the same time, the framework in which corporations operate is defined by energy policies and laws created by governments. There is a reality that cannot be ignored: the indispensable development that will turn the energy sector into one in which RE grows on a huge scale rapidly is possible only with the DMG approach.

Nonetheless, another reality coexists with the one mentioned above. RE projects should harmonize with their natural and human environs to be accepted and to be completed in a timely and efficient manner (Wüstenhagen, 2007) (Schweizer-Ries, 2008) (Wolsink, 1994). For this reason, it is a critical fact that ways to

modify the DMG and bring it closer to the community approach must be found.

The hybrid model offers an optimal approach. In this model, top-down decisions prepare the grounds that facilitates the RE industrial scale projects designed with effective public participation or the community as an investment partner. This model creates policies that promote RE development and bring the indispensable security for the investor are maintained. At the same time, through an open and collaborative process with the stakeholders, every project is designed according to the specific needs of the site, its inhabitants, and the natural environs. The Hybrid model creates the institutional support (e.g., grants, professional consulting, guidance or supporting services) that communities needs to conceive, design and create an RE project in an autonomous exercise of employing their collective capacities to organize and reshape them environ.

This model has framing as its baseline but anticipates overflows. It does not seek the elimination of overflowing, but sees it as an inevitable reality and adjusts to it. The elements outside the norm (not so rigid now) are analyzed; the claims are kept in mind and incorporated into the project to improve it. The decision flow is top-down in the policy establishment phase, but it does not dominate the project's design. Adjustments to the top-down decisions to obtain a better fit to local circumstances may be claimed from organized groups. It will require collaboration and flexibility of the market and the government. This instigates a planning transformation in which national strategies are implemented following local consideration and conflict is turned into consensus.

In this way, this new model follows an action model that begins with rational planning and a proposal by the market and government, but local authorities and communities are consulted. This model is Propose-Consult-Consider-Modify-Proceed. With this action model, conflicts are not identified as pitfalls but as opportunities for improvement; land use does not represent a problem because its use is planned collaboratively. Thus, corrective instruments are not seen as necessary. On planning, the approach can be mixed, since Rational Planning establishes the baseline of the project and collaborative planning works with the needs and particularities of the site.

The Hybrid Model may seem utopian, but the aim of proposing the concept is to draw "the perfect picture" and to urge its emulation to the extent that it is possible.

Linking the three models

Three types of development have been reviewed, not with the intention of grouping RE projects in one or other kind of development, but with the purpose of marking three points in the development line, DMG, Hybrid and DC (Figure 1) to provide insight into RE development. Additional insight into RE development can be gained by taking into consideration the level of local participation and the outcome's distribution.

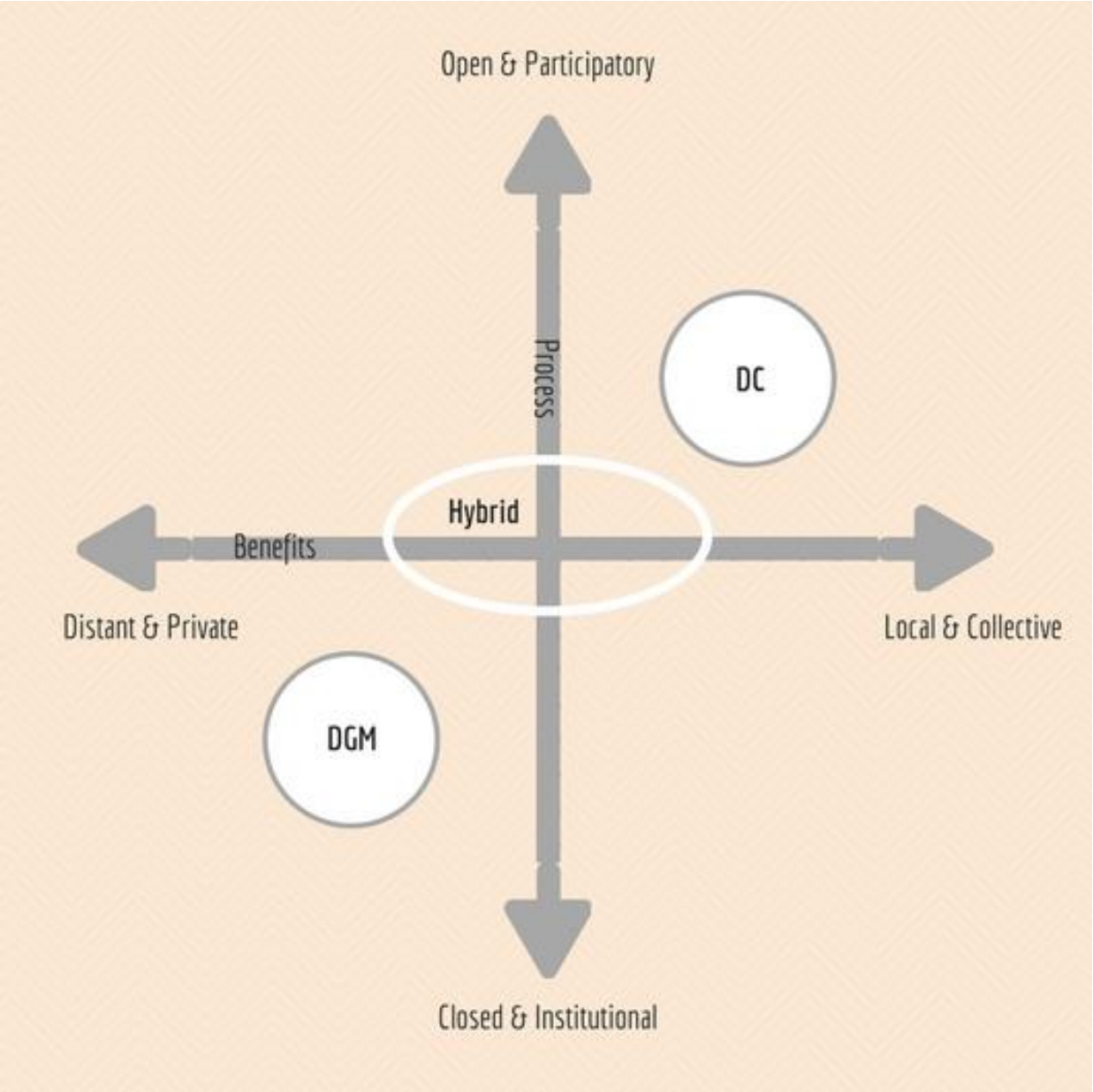
To define the distinctive characteristics of community renewable energy compared with other RE installations, Walker & Devine-Wright identified two critical dimensions that underlie the views of several stakeholders. The first one is the process dimension that is concerned with

“who a project is developed and run by”. The second one is the outcome dimension concerned with “how the outcomes of a project are spatially and socially distributed in economic and social terms”. In the original diagram, Walker & Devine-Wright used the term “outcome” to refer to “benefits particularly in economic or social terms”. However, his explanation does not take into consideration that the outcomes of an RE project may be negative externalities as well as benefits. Therefore, it is possible that the benefits are distant and private, but the negative externalities are local and collective. To illustrate this concept while maintaining Walker & Devine-Wright's diagram, "outcome” has been substituted for “benefits”.

The figure 2 shows the three models of RE development discussed in this article. The DMG is positioned in the third quadrant; as previously mentioned, this model is marked by a closed process to almost any group or individual that is not at the top of the decision-making hierarchy. The economic benefits (profits from the energy supply sales) are retained at the private level, leaving little or none to the communities. In fact, it is possible that the local community will neither consume the electricity generated nor benefit significantly by being employed at the plant. In the first quadrant is shown the DC that has an open process in which the community takes part since this model emerges from the community. Therefore, the benefits are local and collective.

Finally, in a utopian situation, the hybrid model touches the four quadrants in a perfect balance. One segment of the RE development is private; consequently, the economic benefits will be private also. The development is promoted by institutional policies (government) that will be determined by a closed process. This institutional process will promote a project

Figure 2: Bidimensional Diagram of renewable energy development. An adaptation from Walker & Devine-Wright (2008)



design that will be carried out in an open fashion with a representation of all stakeholders. The inclusion and participation of community members will be indispensable, with their serving as managers of part of the project, providers of service, landlords, or owners or shareholder of part of the project. The community participation is not limited to consultations, but also in a form of commercial, investment o partnership agreements.

It is impossible to identify one of these RE development models as a “one size fits all”. Each one could be implemented in specific conditions. For example, the DMG could be applied in a project that is in an isolated zone that has no nearby communities that could be negatively affected by the project. The ideal site for DMG development will be one already impacted by previous development(s), and that has little or no ecological, cultural, or historical value, for example, and abandoned an industrial site. In these circumstances, the market and government could have a higher possibility of free rein to achieve the project with a minimum objection. Nevertheless, even in these conditions meaningful public consultation and collaboration is needed.

The DC could be used in communities that are organized and have strategic plans for sustainable development. As previously mentioned, it is very likely that the projects will be small scale due to the limited resources of the communities. This type of development could be used to improve the local economy, promote a sense of belonging, and build community pride.

In conclusion, the hybrid development could be applied to obtain the goal of RE development at a national level because it maintains private capital benefit while seeking local community best interest.

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