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Implementing net metering policies in Latin America and the Caribbean: Design, incentives and best practices.

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1. Introduction[1]

Net Metering (NM) policies have been widely used as a mechanism to incentivize the adoption of distributed generation (DG) resources, especially by small consumers like households and small business. The most general definition of a Net Metering policy is the permit given to utility-connected consumers to offset their consumption by inputting self-generated electricity surplus into the network and generating credits that can be used afterwards (Darghouth, Barbose, and Wiser 2011). Even though the general definition is straightforward, the design of Net Metering policies varies across countries. For instance, a policymaker should decide elements like the objective of the policy (promote the adoption of DG systems or guarantee the financial sustainability of utilities), the compensation scheme (by energy or cash), the minimal technical requirements of an installation to guarantee the quality of distribution generation, the rate at which credits are exchanged with the network, the financial mechanisms (if there are any) and how to fund it, among other decisions. Thus, many countries – including Latin America and the Caribbean (LAC) – implement different set-ups of Net Metering policies that can produce a comprehensive set of incentives, challenges, and outcomes.

Overall, the most common technology used to perform Net Metering with the grid is the Solar Photovoltaic (PV) system, by which users generate energy while there is sunlight available. Even with the globally rapidly decrease in PV equipment prices and maintenance costs and an increase in generation efficiency, the adoption of DG technologies still encounters many constraints (Candelise, Winskel, and Gross 2013). These limitations may have different sources, such as households budget constraints, complicated or unattractive financing mechanisms, lack of knowledge about distributed generation and Net Metering, the lack of local technical capacity to assist installation, or a regulatory prohibition.

In Latin America and the Caribbean, 17 countries have adopted policies to introduce net metering by 2018, with different stages of implementation (as pilot, regional, sectorial or national projects). Each adopting country has its own settings of prior rules and socioeconomic characteristics, which affect the outcome of NM policies. Hence, the goal of this study is to explore the heterogeneity of Net Metering policies adopted in the LAC region and the incentives they provide for the adoption of DG systems.

[1] We'd like to thank the comments and contributions made by Tomas Serebrisky, Arturo Alarcón, Jordi Abadal.

2. Designing a Net Metering Policy

The Net Metering scheme can be understood as an intertemporal offset of self-generated energy (converted in credits) for future use. The basic concept is that a household energy surplus in *t* can be converted in cumulative credits – measured in energy (kWh) or monetary units – which can be used anytime between *t+1* and *t+n*, with n being the maximum accumulation period (that can be indefinite). The accumulation of credits is not accounted only by period, but also by the accumulated product. (IRENA, IEA, & REN, 2018) splits it in two schemes: Net Metering, in which the offset occurs in energetic terms, and Net Billing, in which the compensation is monetary. However, in many Net Metering experiences, the term Net Metering is commonly used for both schemes.

In a simplified scheme, Figure 1 exemplifies the working of a Net Metering policy by offsetting the accumulated credit (energy or money) in period 1 to the consumption in period 2. The period between periods 1 and 2 can be, theoretically, as short as the policymaker wishes. For instance, assume that period 1 is the consumption of energy during off-peak demand with high generation conditions (an average house at noon) and period 2 is a peak demand with low-to-nothing generation conditions (*i.e.* 7 P.M. in the summer). The surplus of generation in period 1 is transported to period 2. At the end of period 2, the net energy consumption to be charged is almost completely compensated by the self-generation. In this case, the compensation rate (the ratio between generated energy and energy-equivalent credits) is equal to one, meaning that every unit of energy injected in the grid as a surplus can later be consumed.

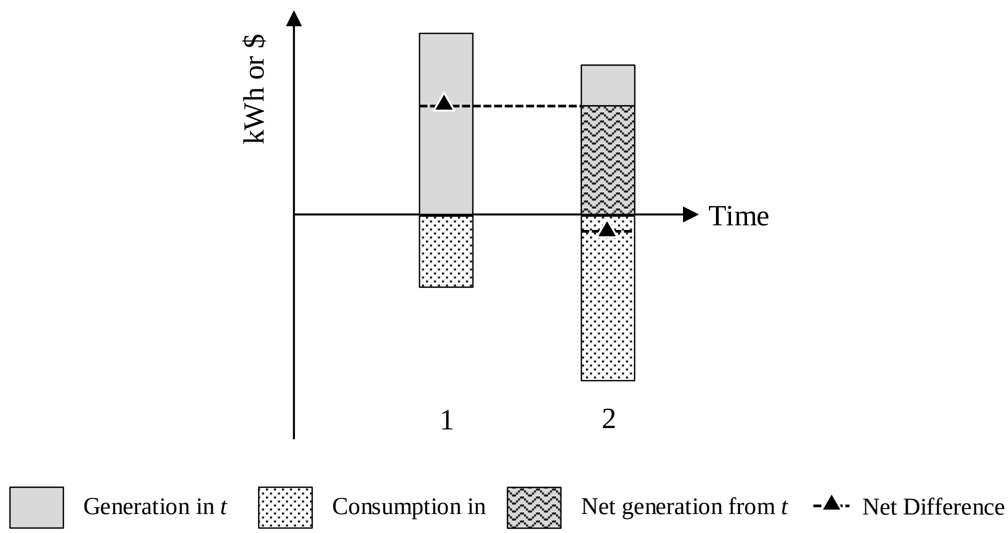

Figure 1. 2-periods net metering accumulation

Source: Own elaboration.

Note: Considering no hourly tariff and Compensation Rate equal to 1

2.1. Benefits and Challenges of a Net Metering Policy

The Net Metering policy should be viewed via at least three different perspectives: the regulator, the utility, and the consumer decision process. The benefits desired by all players are different and should be considered differently, even though the decision taken by one affects the other.

On one hand, consumer benefits are restricted to recover the project investment and, if legally possible, a monetary surplus. Moreover, consumers may also be guided by environmental concerns that may influence household behavior. Even if the rate of return of a distributed system is negative, some consumers may be willing to pay for it to satisfy their environmental beliefs. However, we cannot assess how much consumers are willing to disburse for it.

In the case of a monetary surplus, in some situations it can mean: higher (i) energy consumption, (ii) savings or (iii) non-electricity goods consumption. With metering policies, these benefits can be achieved by (a) reducing the utility bill, (b) receiving a monetary payment for energy inputted to the grid, or (c) levelling energy costs over time (if there is an hourly tariff combined with a Net Metering policy).

On the other hand, utilities, while having less control over the decision process, are affected directly by it. The provision of NM services may directly affect the revenue recovery of the company and the rentability of future investments. The services provided by the utility might experience distortions, which would require the recovery of investments to assure the operation and the remuneration of services by the imposed tariffs. And then there are costs that must be paid by some party, in the form of a loss to the utility, a charge to users (generators or not) or a direct public subsidy.

The regulator's decision process is more complex, involving the coordination of energy self-generators with the utility and the wholesale market. The rules designed by regulators must keep goals clear. Overall, the adoption of Net Metering policies coordinates the different objectives of regulators: (1) to promote intermittent technologies to reduce the marginal cost of generation, (2) to incentivize the residential installation of DG systems, and (3) to avoid distortions in the tariff structure.

The expansion of distributed generation capacity in the grid may create a challenge to tariff design, especially concerning the revenue requirement of utilities to pay for investments and operation (Felder and Athawale 2014; Castaneda et al. 2017). The incorporation of on-grid DG capacity[2] distorts the tariff structure that balances users and utilities requirements. One role of the regulator is to implement the rules to re-organize it and diminish the risks of contractual default caused by tariff distortions (Picciariello et al. 2015). On the one hand, tariffs must assure that utility investments are paid in the long run and that operational costs are covered in the short-term. On the other hand, tariffs should create signals for network users to make decisions and to guarantee the firmness provision of the service. However, in a context where users are becoming more heterogeneous in how they use the network services, distorted signals to users can create revenue problems for utilities.

This scenario might lead to a re-distribution of network costs among users, as (Felder and Athawale 2014) and (Khalilpour and Vassallo 2015) point out, and lead to a "death spiral" of network distribution. The death spiral occurs when the tariff design recovers the revenue loss of DG penetration by re-distributing the costs among all the players. The higher tariff would increase the net benefit of DG installations and lead to a higher adoption rate of these systems, returning to a point where costs need to be re-distributed indefinitely. In this sense, utilities providing network services would bear most of the risk from cost reallocation.

[2] In opposition with off-grid Distributed Generation capacity.

Nonetheless, as highlighted by (Laws et al. 2017), the death spiral is only a threat in certain conditions, such as a high adoption rate combined with a high utility cost, the possibility of community generation, and the pricing structure of Net Metering. Their model shows that (i) distributed energy should be paid at the wholesale price rather than at the retail tariff. This would reduce the acquisition costs for utilities and diminish the demand for revenue recovery. Also, a demand charge (related to the peak demand of the period) separated from the energy charge would also be a better price signal; the energy charge for PV users would be lower while still paying for needed investments.

2.2. Policy-Design Decisions

The design of a Net Metering policy involves many decisions to be taken by the regulator. Figure 3 schematizes the framework of decisions of regulators concerning Net Metering rule design. The framework is divided in three parts: (1) Accounting, (2) Restrictions and (3) Granularities.

First, regulators must define what is traded between the distributed generator and the network. Two possible types of credits can be accumulated: (a) energy credits and (b) monetary credits. Energy credits compensate users for the generated energy surplus, measured in kwh. This credit can be a full compensation – 1 kwh of surplus equals 1 kwh of credit – or compensated at a different rate (greater-than or smaller-than 1). If Net Metering is accounted in energy credits, regulators should define if credits are personal and can be used only by the generator, or if they can be traded among users and virtually transferred.

The second possibility is to accumulate monetary credits. In this case, the prosumer[3] receives credits as a monetary equivalent of the generation surplus. If Net Metering is accounted in monetary credits (in this case it can also be called Net Billing), then regulators need to define the price that energy is going to be traded with the grid including the existence of any transaction fee, service fee, or premium rate. The most common trading rates used are: (a) retail rate (which includes generation, distribution, and transmission tariffs), (b) wholesale generation rate (which reduces the financial disbursement of utilities, but creates less incentives for prosumers), and (c) premium rate (which compensates surplus with a premium, for instance, 1.15 kWh credits for each 1 kWh of generated surplus). Nonetheless, rate schemes are not limited to these three. It can also

[3] An agent that combines both consumer and self-producer roles.

compensate using hourly tariffs, flexibility price, or nodal prices, for example, or even a combination of different tariffs, such as a two-part compensation rate (compensating energy plus flexible availability).[4]

Then, the regulator must define the accumulation rules. They are summarized in Figure 2. First, the regulator defines if accumulation is possible. If yes, then he or she must define the accumulation period or the number of billing periods in which credits (energetic or monetary) can be used. After the accumulation period credit expires, rules must define the next steps. Three situations are possible: (i) a monetary compensation of credits (also known as a "cashback scheme"[5]), (ii) the renovation of the roll over period, or (iii) balance writes-off (and utilities convert it from liability into current asset on the balance sheet).

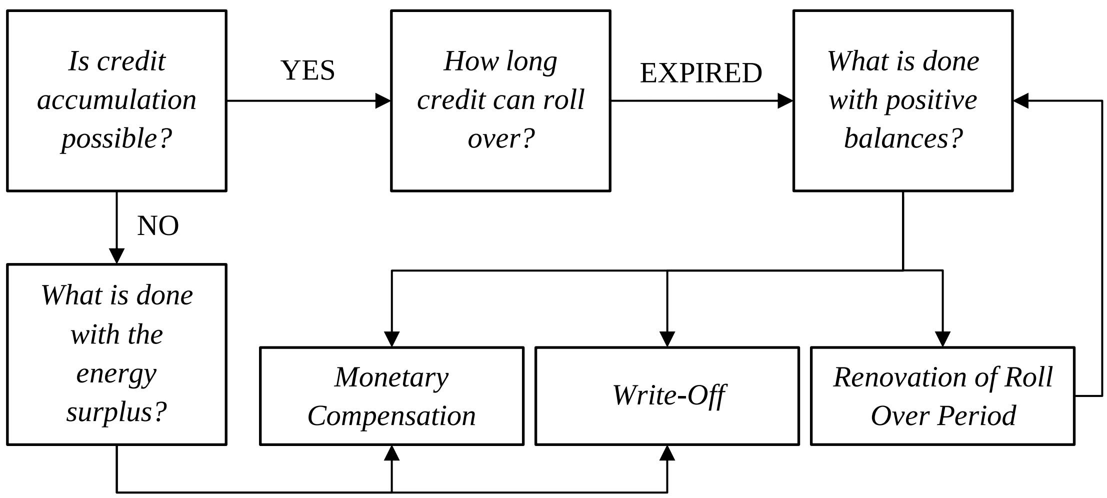

Figure 2. Accumulation rule decision process

Source: Own elaboration

The second level of decision concerns installation restrictions, which can be divided into two categories: *Quantity*, or capacity restriction, and *Quality*, or technical restriction. Net Metering rules can permit unlimited capacity installation or limit it to some degree. On the one hand,

[4] For instance, in the United States – where Net Metering rules are defined by each State –, the policy adopted in the District of Columbia has two price sets. For installations up to 100 kW, the retail tariff is applied, and from 100 kW to 1 MW of installed capacity, the generation price is used to compensate users. This is an example of a rate differentiation that can be used as a Net Metering pricing policy.

[5] Notice that rules can also define voluntary cashback, in which users can demand the money from the credits before the expiration. This situation has two sides: it increases the financial liquidity of prosumers and can incentivize the adoption of PV systems, but it also can decreases the financial liquidity of utilities (or another responsible agents).

unlimited capacity installation can force a rapid increase in DG capacity into the grid, creating coordination problems between utility investments and distributed generators. On the other hand, unlimited capacity can incentivize the adoption of DG systems if monetary compensation is possible since adopters can experience financial gains from increasing the installed capacity. The restriction levels can be set at residential, transmission node, or system wide. For example, a higher density of DG systems connected to a single node might create a local frequency balancing issue if not restricted.

Quality restriction refers specifically to the technical procedures used by the regulator (or any other designated party, such as the utility company) to assure that the DG system is stable and secure, the meter is reliable, and the installation is completed following all the required technical standards. Rigid quality restrictions can increase installation and operation costs, making SG systems less attractive to potential adopters.

The net balance resolution or granularity must be specified in both spatial and temporal terms. Temporal granularity can be understood as the cycle in which the consumption and generation balancing operation is calculated. Thus, it can be calculated at the end of a time unit (*i.e.* minutes, hours, or days) or at the end of the billing cycle or fiscal year. After this, the credit balance is accounted.

Spatial granularity refers to the level of balancing aggregation between distributed generators, which can be as small as a single individual (with many facilities) or a single household facility or even multiple individuals aggregated in a net energy balancing group. A less disaggregated level, such as nodal aggregation, would allow the formation of neighborhood balancing aggregators, which can increase the attractiveness of installation by the sharing operational costs among users, or competing in the wholesale market with a higher flexibility than single users. Lastly, an ownership-based spatial granularity would further increase the possible geographical disaggregation of the balancing operation allowing users with non-contiguous distributed generation facilities, located in different places, to balance virtual energy across the network.

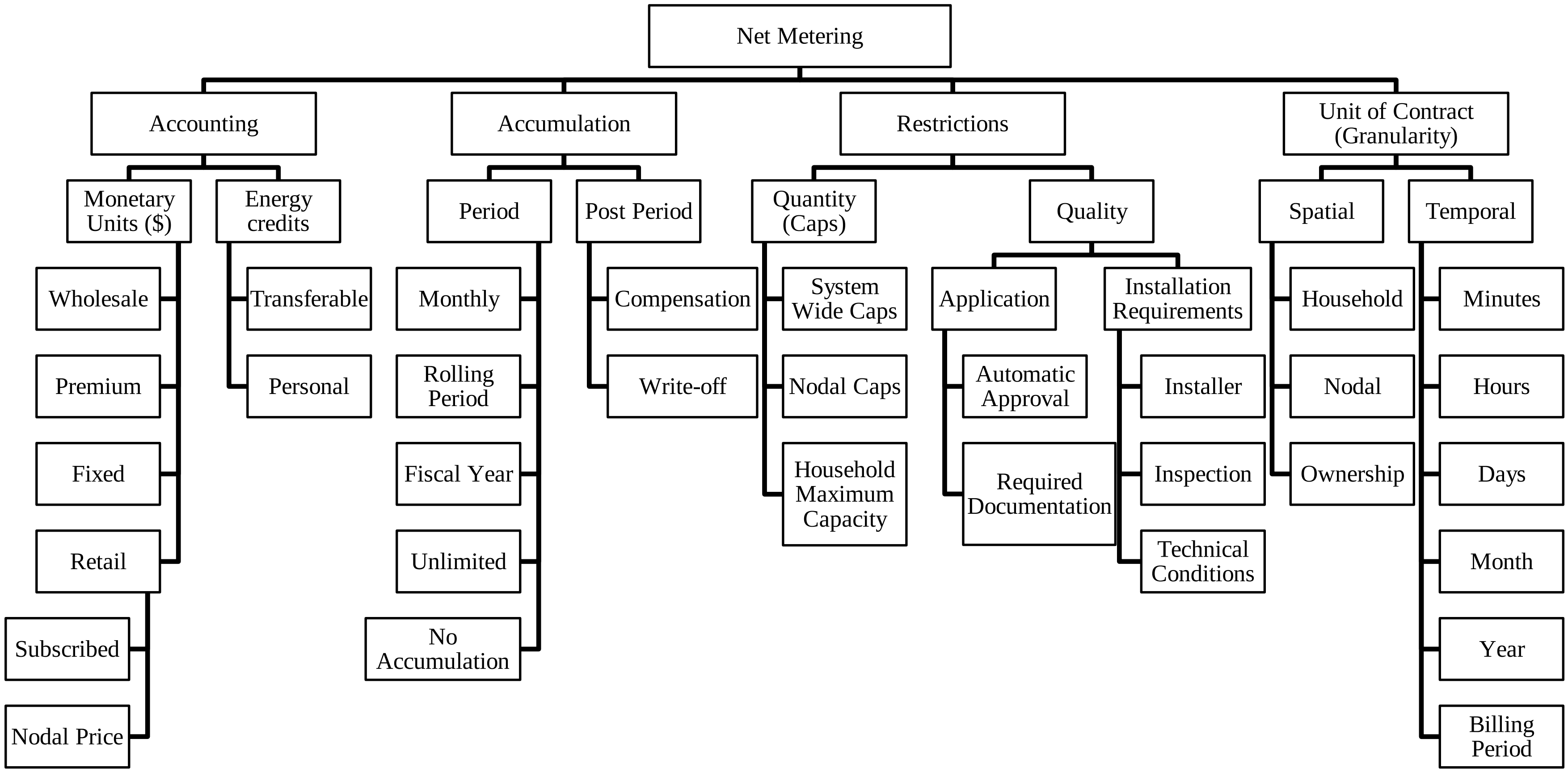

Figure 3. Framework for Regulatory Decision Process

Source: Own elaboration.

3. Net Metering Policies in the Latin America and the Caribbean Region

Currently, Net Metering and Net Billing policies are one of the main mechanisms to incentivize the adoption of Distributed Generation in the LAC region. From 2008 to 2018 (July), 17 countries adopted one national policy to implement Net Metering (Figure 4). Of these countries, Jamaica and The Bahamas implemented pilot projects prior to the actual implementation, four countries[6] updated regulations during the period, and one country (Argentina) unified regional programs of Net Metering into a national regulation. Of these countries with Net Metering laws in-force, 10 refer to the policy as "Net Metering,"[7] four use the term "Net Billing,"[8] and one (Mexico) uses both terms interchangeably. Terms are not related with the accounting unit (energy or cash).

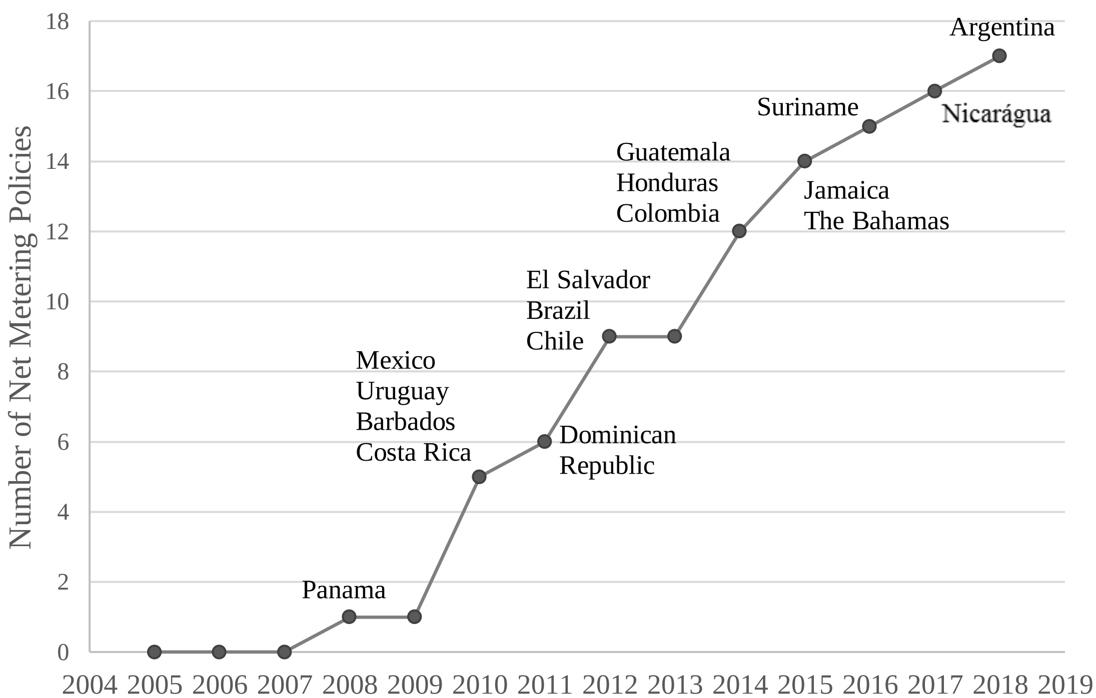

Figure 4. Timeline of Net Metering Policies adoption in the LAC region

Source: Own elaboration based on BNEF, IEA/IRENA, Energy Laws in LAC countries.

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[6] Panama (2012), Brazil (2014), Guatemala (2014), Colombia (2018).

[7] Panama, Uruguay, Costa Rica, Dominican Republic, El Salvador, Brazil, Guatemala, Honduras, Colombia, and Argentina.

[8] Barbados, Chile, Jamaica, and the Bahamas.

3.1. Accounting and Accumulation

First, rules must define the product to be traded in a net metering scheme, or the accounting unit, and how accumulated credits can be transposed to be used in the future. In terms of *accounting*, 10 countries adopt monetary credit accumulation, four countries adopt energetic credit accumulation, and one country (Costa Rica) offers two types of contract, the "Simple," with a monthly rollover of energetic credits, and the "Complete," with yearly monetary compensation.[9] The countries adopting only one type of accumulation scheme are:

- *Energetic accumulation*: Uruguay, Brazil, Suriname, Guatemala, and The Bahamas;
- *Monetary accumulation*: Panama, Mexico, Barbados, Dominican Republic, El Salvador, Nicaragua, Chile, Honduras, Colombia, Jamaica, Argentina, and Brazil (for hourly-rates).

The *accumulation periods* in each country vary from one billing period to five years to no-specific definition. The list of countries is summarized in Table 1 according to the accumulation period, the accumulation units, and the aftermath of credits after expired. Eight countries adopt cashback policies, allowing users to convert credits in monetary earnings after the accumulation period limit, and only three countries write-off the credits.

In Guatemala, Distributed Generators can choose to "sell" surplus energy in two markets. They can sell directly to the distribution company, receiving energetic credits with indefinite accumulation period. Or, they can choose to sell to the wholesale market, where they are paid the wholesale price. Both options are not mutually exclusive and can be used simultaneously. For instance, a distributer can generate enough energy to (1) satisfy current consumption, (2) smooth future consumption by offsetting energy credits within the distribution network, and (3) sell the overgeneration credits on the wholesale market. However, the technical specifications that need to be followed to receive the authorization to sell energy directly to the wholesale market can be constraining to users.

Table 1. Accumulation units and periods in Latin America and the Caribbean

Country	Accumulation Period	Accumulation Unit	After Expiration
Uruguay	0 Months	Energetic	Cashback

[9] The "complete" modality started in 2015.

Dominican Republic	1	Billing period	Monetary	Cashback
Jamaica	1	Months	Monetary	Write-Off
The Bahamas	1	Billing year	Energetic	Cashback
Barbados	3	Months	Monetary	Cashback
Argentina	6	Months	Monetary	Cashback
Panama	12	Months	Monetary	Cashback
Mexico	12	Months	Monetary	Cashback
Costa Rica	12	Months	Hybrid	Cashback
Suriname	12	Months	Energetic	Cashback
Nicaragua	12	Financial year	Monetary	Cashback
Chile	12	Months	Monetary	Write-Off
Brazil	60	Months	Energetic/Monetary[10]	Write-Off
El Salvador		Indefinite	Monetary	NA
Guatemala		Indefinite	Energetic	NA
Honduras		Indefinite	Monetary	NA
Colombia		Indefinite	Monetary	NA

Source: Own elaboration.

3.2. Quantitative and Qualitative Restrictions on Installation

Table 2 displays the quantitative and qualitive restrictions adopted by Net Metering policies in the LAC region. Overall, almost every country in the region (except for Barbados, Argentina, Costa Rica, Colombia, and El Salvador) adopts a DG capacity cap at the residential level. This cap varies from 100 kW in Uruguay, Jamaica and The Bahamas, to 5 MW in Brazil. In Barbados, the restriction is imposed system-wide, and DG cannot surpass 10% of the total country capacity. In Costa Rica, new installations should reach a maximum of 15% of the previous year's demand. In Colombia, the restriction is applied at the distribution network level, imposing caps on the substations and transformers which connect the distribution generators (15% of capacity and 50% of demand). Other countries, like Nicaragua and Suriname set annual electricity consumption as a cap for annual electricity generation.

On the qualitative side, countries define the technical installation requirements and who is responsible for authorizing new installations. Four countries adopt licensed installation. Once the installation of certified equipment is completed by licensed installers, then DG can enroll in net metering. Also, 12 countries require distribution authorization to certify that proposed installations

[10] In Brazil, a mixed accumulation unit is used when the consumer adopts the hourly tariff. Accumulation is done by tariff block using energetic units but can be converted from one to another block using monetary units.

fulfill regulatory requirements and to inspect if installed equipment is reliable in order to participate in net metering.

All countries in the LAC region with Residential Net Metering policies in-force adopt it at a household level with a monthly billing period. Thus, alternative organizations, like the aggregation of users and a shorter billing period, are not possible.

Table 2. Qualitative and Quantitative Restrictions in LAC Net Metering Policies

Country	Maximum Installed Capacity Allowed (kW)				Installation Technical Authorization
	System Wide	Nodal	Distribution	Residential	
Uruguay	-	-	-	100	Licensed Installation
Jamaica	-	-	-	100	Licensed Installation
The Bahamas	-	-	-	100	Distribution Company
Dominican Republic	-	-	-	1000	Licensed Installation
Barbados	10% of Total Capacity	-	-	-	Distribution Company
Argentina	-	-	-	-	Distribution Company
Panama	-	-	-	500	Distribution Company
Mexico	-	-	-	500	Distribution Company
Chile	-	-	-	2000	Licensed Installation
Costa Rica	15% of Yearly Demand	-	-	-	Distribution Company
Suriname				-[11]	Distribution Company
Nicaragua			-	5000[12]	Distribution Company
Brazil	-	-	-	5000	Distribution Company
Honduras	-	-	-	250	Distribution Company
Colombia	-	-	15% of Substation Capacity 50% of Substation Demand	-	Distribution Company
Guatemala	-	-	-	5000	Distribution Company
El Salvador	-	-	-	-	Distribution Company

Source: Own elaboration

[11] In Suriname, the annual generated output should be smaller than the annual consumption.
[12] In Nicaragua, installations are divided into (i) low tension: unlimited, but limited to the annual demand of the consumer, and (ii) medium tension: up to 5 MW.

4. Net Metering Incentives and Policy Implications

Here we focus on consumer-side incentives generated by a Net Metering policy. We employ a basic set-up using Mexico as an example (see Annex 1 for the numbers used in the calibration) and simulated marginal changes (upwards and downwards) with *ceteris paribus*. Then, we make a cost-benefit analysis of a Solar Photovoltaic System project (calculating the Net Present Value,[13] NPV) and check whether the project is viable for the average consumption of 2.6 kWh/day. Figure X shows the NPV behavior for each set of variables

The tariff level has a positive effect on the viability of PV with NM policies. This occurs as a combination of two complementary effects. First, an increase in the tariff level decreases the Net Present Value of consumption, which means that energy bought from the network is more expensive. Second, assuming the Net Metering Rate is calculated over the retail price (as is the norm in almost every NM experience), the increase in tariff level increases the remuneration of the energy load to the network. Thus, the net present difference (between two sates: with and without PV) increases (and turns positive) with a higher tariff.

However, the retail tariff used to remunerate energy sold by distributed generation can also have different trading terms. The Net Metering Rate is calculated as a multiplier factor of the retail tariff. If greater than one, the generation is remunerated by a premium tariff. For instance, a factor of 1.1 implies that the price of DG energy is 10% higher than the price of consumption. In some cases, the net metering premium is not calculated directly over the retail tariff, but over wholesale costs. This is the case of Jamaica, where the premium is defined as 15% over the price of oil-based generation displaced by DG production. These schemes are more volatile to decisions taken on the wholesale market. On the other hand, the Net Metering Rate can also be smaller than one. In this

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[13] The NPC is calculated by: $\Delta NPV = \sum \frac{p_{kWh}(G_t(S) \cdot N_{rate} - C_t)(1+tax) - p_{fixed}(1+tax) - M_t(S) - F_t(S)}{(1+\pi_t)(1+i_t)^t}$. Where, C_t is the consumption in kWh in the period t, p_{kWh} and p_{fixed} are the variable and fixed tariffs, respectively, tax is the tax over the bill, π_t is the inflation rate in t, and i_t is the interest rate in t, G_t is the self-generation in kWh in the period t, $M_t(S)$ is the yearly operational and maintenance cost as a function of the installed capacity S, I_0 is the initial capital investment as a function of S.

case, the benefits of selling energy are lower than the cost of buying it from the grid. This scheme creates less friction between users' needs from the network and the revenue requirements of utilities; however, it can slow the rate of adoption in different setups. In the case of Mexico, for example, even a Net Metering Rate of 0.8 represents a net benefit and can still be profitable. But the profitability is also sensitive to the level of household consumption.

A higher consumption level increases the present costs of electricity in a situation without PV installation, making PV Systems more profitable. Similarly, greater installed capacity increases the energy output of the system, which increases the Net Present Value of generation if all energy can be sold to the network. However, returns on installed capacity vary from region to region and over time. Different regions have different irradiation intensities and period of sunlight, and improvements in technology may reduce the losses and increase the energy output by increasing the capacity factor.

When installing new systems of distributed energy, the cost of acquiring the system is an important variable. In our model, the cost is influenced by four variables: capital costs, operational costs, lending interest rate, and payment period. Capital and operational costs increase the cost of acquiring and maintaining the system properly working, while the lending interest rate affects the cost of financing DG equipment installation.

The cost of acquiring a DG system increases if the lending interest rate increases. The payment period affects the duration of the project. Projects with higher payment periods decrease the cost over time than projects with shorter payment periods. For instance, in the case study, projects with payment periods shorter than four years are not profitable since the NPV of the DG system is negative, while projects above five years are only profitable with cashback schemes.

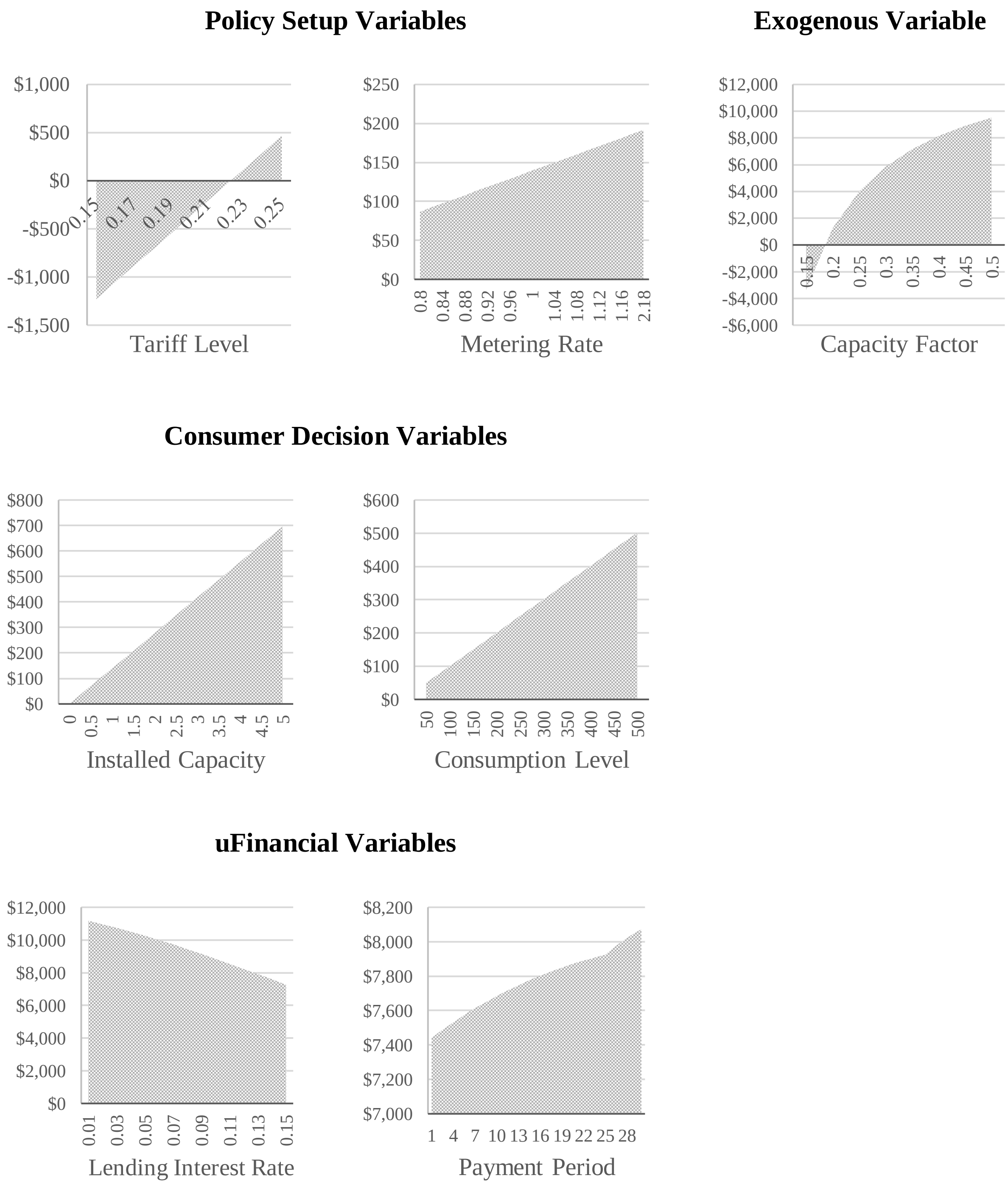

Figure X. Sensitivity Test to Policy, Consumer, Financial and Exogenous Variables

Overall, cashback schemes are attractive to the adoption of DG systems because they remove the Net Present Value of Generation ceiling, allowing users to make monetary gains. However, this scheme can lead to some problems if the adoption rate is high, such as (i) overgeneration during peak periods, (ii) nodal unbalances, (iii) distortion in the equilibrium between investments and utility revenue requirements. Conversely, schemes without cashback can impose a lower adoption rate.

Of course, many factors can affect the adoption rate of DG systems, including non-monetary factors like environmental concerns. Overall, looking at only the economic value of Distributed Generation projects in Net Metering Schemes, Table 3 summarize the incentives created by each variable design related to the DG adoption rate. The interaction of each variable design, of course, creates different outputs and depends on the magnitude of the individual effect.

Table 3. Summary of Variable Effects

Key Simulated Variable	*Effect on DG Adoption Rate*
Tariff Level (↑)	+
Net Metering Rate (↑)	+
Cashback Scheme (Yes)	+
Lending Interest Rate (↑)	-
Payment Periods (↑)	+
Consumption Level (↑)	+
Needed Installed Capacity (↑)	+
Capacity Factor (↑)	+

5. Final Remarks

Net Metering has been viewed as a successful policy to promote the adoption of Distributed Generation Resources, especially Solar Photovoltaic. However, the design of this policy is very heterogeneous among countries and many experiences have proved successful in adopting and implementing NM policies. In the Latin America and the Caribbean region, 15 countries have Net Metering policies in-force, with different policy-settings.

The goal of this study was to make a policy assessment of Net Metering policies in the LAC region in terms of policy design and incentives. First, we performed an economic evaluation of Net Metering policies and the elements that regulators should decide on to achieve their adoption goals. Then, we analyzed the design of these policies in Latin America and the Caribbean and the incentives created by them.

A policy assessment can be made to improve the effectiveness of Net Metering policies to increase the adoption rate of PV systems. First, cashback schemes are more attractive for adopters than the write-off of credits. Second, credits compensation of can be made via many pricing schemes, with two types being the most common: retail tariff and wholesale price. The retail tariff increases the remuneration of prosumers but can financially constrain the utility. This leads utilities to incorporate losses on the tariff revision, which can create undesired distributional effects. Wholesale price, on the other hand, can reduce the attractiveness of a PV project, but reducing the risk to the utility. Even with the lower rate of return, the PV system would still be economically in many situations.

Overall, Net Metering policies look promising in promoting the adoption of distributed energy generation by household consumers, especially in Latin America and the Caribbean, where solar irradiation is a great advantage to the viability of solar photovoltaic generation. Even though many other policies are also used around the world, Net Metering seems to be the preferential policy to promote renewables on a distributed scale in LAC.

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Annex 1 – Calibration of NPV Model

Category	Variable	Mexico (2017)
Regulators	Tariff Level	0.23 USD/kWh
	Net Metering Rate	100%
	Cashback Scheme	Yes
	Accumulation Period	1 Year
	Accumulated Credit	Cash
Financial Institutions	Lending Interest Rate	7.75%
	Payment Periods	25 years
Consumers	Consumption Level	130 kWh/Month
	Installed Capacity	4.6 kW
Exogenous	Inflation Rate	5%
	Real Discount Rate	2.75%
	Capital Cost of DG	965 USD / kW
	Operational Cost of DG	30 USD / year (USA)
	Depreciation Rate of DG	5% / year
	Capacity Factor	20%