PUBLIC VERSION

Haitian Solar-Powered Micro-grid Potential: Town Ranking Report

Client: Enèji Pwòp, SA
Contractor: Energy and Security Group

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Executive Summary

Energy access is low in Haiti, where an estimated 70% of the population lacks a connection. In the absence of reliable electricity, economic growth is stifled and households must resort to costly fuel-based lighting and cooking solutions. Enèji Pwòp, S.A, a Haitian social enterprise, seeks to directly resolve this shortcoming with the development of town-sized solar-powered smart grids. Enèji Pwòp operates one such grid in Les Anglais, Haiti, providing nearly 500 homes and businesses with 24-hour electricity, and has set the goal of building 80 more grids in the country in the next 5 years. Unfortunately, a serious shortage of town-specific data has hindered an informed selection of future potentially viable towns, which prevents expansion. The legal and regulatory environment for rural electricity in Haiti has been uncertain and is in flux. In order for any microgrid developments to happen at scale, these problems will need to be solved.

This report addresses these shortfalls. For the market data, this report documents the results and analysis of a nationwide study of 89 rural towns in Haiti assessing the feasibility of microgrid development. Over the course of several months in 2015, a team of 40 field researchers visited the towns, undertaking surveys on economic activities, political will, energy demand, infrastructure and strength of civic organizations. From the data, the towns were scored and ranked based on their potential suitability for a viable micro-grid. Scoring is subject to the weighting of data, which can vary widely, as understanding of micro-grid feasibility criteria evolves. This report presents two different scoring methodologies. Tables below present the town rankings according to the two methodologies.

Table 1. Town Rankings, Version 1

Town Name	Rank	Town Name	Rank	Town Name	Rank
Limbé	1	L'Estère	31	Gressier	61
Petite-Rivière-de-l'Artibonite	2	Arniquet	32	Fonds-Parisien	62
La Victoire	3	Mont-Organisé	33	Dame-Marie	63
Desdunes	4	Désarmes	34	Savanette	64
Dessalines / Marchand	5	Belladère	35	Randel	65
Verrettes	6	Baie-de-Henne	36	Bois de Laurence	66
Anse-d'Ainault	7	Roseaux	37	Capotille	67
Liancourt	8	Bahon	38	Beaumont	68
Belle-Anse	9	Cerca-Carvajal	39	Chantal	69
Maïssade	10	Bord de mer de Limonade	40	Duchity	70
Anse-à-Foleur	11	Cornillon	41	Marfranc	71
Labadie	12	Arnaud	42	Mombin-Crochu	72
Pilate	13	Fond-des-Blancs	43	Mare-Rouge	73
Vallières	14	Ferrier	44	Thiotte	74

Town Name	Rank	Town Name	Rank	Town Name	Rank
Grande-Rivière-du-Nord	15	Thomassique	45	Acul-du-Nord	75
Luly	16	Anse-à-Pitre	46	Paillant	76
Plaisance-du-Sud	17	L'Ïle-à-Vache	47	Carice	77
Côtes-de-Fer	18	Plaisance	48	Borgne	78
Dondon	19	Terre-Neuve	49	Cazale	79
Anse-Rouge	20	Grand-Gosier	50	La Vallée-de-Jacmel	80
Abricot	21	Moron	51	Carcasse	81
Ennery	22	Ganthier	52	Port-Margot	82
Boucan-Carré	23	La Tortue	53	Cahoane	*83
Pointe-à-Raquette	24	Perches	54		
Pont-sondé	25	Bas-Limbé	55		
Pestel	26	Bonbon	56		
Les Irois	27	Petit Bourg de Port Margot	57		
Corail	28	Milot	58		
Fonds-Verrettes	29	Chambellan	59		
Ranquitte	30	Tiburon	60		

* Note: The following six towns were not assessed under this methodology because sufficient data was not available at the time: Anse-à-Veau, Casse, Cerca-La-Source, Grande Saline, Les Cayemites, and Sainte Suzanne.

Table 2. Town Rankings, Version 2

Town Name	Rank	Town Name	Rank	Town Name	Rank
Dessalines / Marchand	1	Thomassique	29	Baie-de-Henne	60
Verrettes	2	Arnaud	32	Grande Saline	60
Les Irois	3	Cerca-La-Source	32	Gressier	60
L'Estère	4	Ferrier	32	L'Ïle- à-Vache	60
Limbé	5	Ganthier	32	La Vallée-de-Jacmel	60
Petite-Rivière-de-l'Artibonite	6	Pont-sondé	32	Ranquitte	60
Cerca-Carvajal	7	Sainte Suzanne	32	Chantal	67
Fond-des-Blancs	7	Anse-à-Veau	38	Cornillon	67
Fonds-Parisien	9	Bord de mer de Limonade	38	Fonds-Verrettes	67
Anse-d'Ainault	10	La Tortue	38	Mombin-Crochu	67
Bas-Limbé	11	Luly	38	Pestel	67
Beaumont	11	Anse-à-Foleur	42	Plaisance-du-Sud	67
Perches	11	Arniquet	42	Pointe-à-Raquette (La Gonâve)	67
Belladères	14	Boucan-Carré	42	Roseaux	67

Town Name	Rank	Town Name	Rank	Town Name	Rank
Desdunes	15	Paillant	42	Bois de Laurence	75
Dame-Marie	16	Plaisance	42	Carice	75
Désarmes	16	Thiotte	42	Grand-Gosier	75
Liancourt	18	Tiburon	42	La Victoire	75
Milot	19	Bonbon	49	Marfranc	75
Anse-Rouge	20	Dondon	49	Terre-Neuve	80
Maïssade	20	Duchity	49	Casse	81
Mare-Rouge	20	Pilate	49	Savanette	81
Belle-Anse	23	Port-Margot	49	Abricot	83
Ennery	23	Borgne	54	Corail	83
Côtes-de-Fer	25	Capotille	54	Randel	85
Vallières	25	Cazale	54	Cahouane	86
Acul-du-Nord	27	Labadie	54	Petit Bourg de Port Margot	86
Anse-à-Pitre	27	Les Cayemites	54	Carcasse	88
Grande-Rivière-du-Nord	29	Mont-Organisé	54	Chambellan	89
Moron	29	Bahon	60		

For the legal and regulatory landscape assessment, this report draws some conclusions and makes some recommendations, however recent developments in the evolving landscape render these findings merely reference points in a larger energy policy transition that will require further assessment as time passes.

We contend that energy access microgrids do indeed offer an enormous opportunity for rural electrification in rural Haitian towns, unlocking decentralized, rural economic opportunities for local enterprises and offering an exciting market for energy business opportunities with the potential to demonstrate in Haiti what is possible in other countries around the world. That said, the ongoing political crisis combined with the 'process risks' of microgrid development in Haiti lead us to conclude that further microgrid demonstrations would be helpful in order to prove the viability of the model.

Introduction

Enèji Pwòp, S.A., a Haitian social enterprise, has the goal of electrifying 80 towns in Haiti by 2020. Currently, it operates a solar-powered, town-sized microgrid in the town of Les Anglais. The energy scale-up for the next 40 grids will involve the construction of specialized grids that are tailored to the physical infrastructure, energy demand, resource potential, and community and political context of each town.

Feasibility Study Process

Following a desk study of over 100 small, unelectrified Haitian towns, field research for a feasibility study of 89 rural towns was undertaken across Haiti from July-October of 2015 to determine potential for solar-powered town-sized microgrids. Electricité d'Haiti (EdH) The research in each town focused on political will, economic activities, energy demand, infrastructure, and strength of civic organizations. This feasibility report has ranked the towns based on their potential and provides additional context for each of the top towns.

Energy Access Context

In Haiti, 70% of the population lacks access to electricity. For the approximately 30% of the population that is connected to a grid[1], service is often erratic and electricity rates are some of the highest in the world. Despite the high rates, cost-recovery for utilities remains elusive.

While the central utility, Electricité d'Haiti, works to improve service to its customer base, there remains a big opportunity to expand energy access in Haiti through de-centralized solutions. Some innovation is already taking place. In Les Anglais, in the Sud department, EarthSpark International has built a 100 kW solar-powered micro-grid serving 500 connections. In neighboring towns, including Côteaux, Roche-à-Bateau and Port-à-Piment, the National Rural Electric Cooperative Association (NRECA) established an electric co-op, serving 1600 customers via a solar-diesel hybrid system. This project anticipates that the research and analysis it provides will facilitate the way for replication of similar micro-grids in other towns where conditions are favorable.

Issues and Challenges

Risks to Microgrid Development in Haiti

While there are many reasons to be optimistic for microgrid development in bringing sustainable energy to Haiti's rural towns, there nevertheless remain many risks to energy access microgrid development in Haiti. The three biggest risks are discussed here. None of them are insurmountable, but each will need to be carefully

[1] (2013) Population without Electricity. Inter-American Development Bank and Latin American Energy Organization.

addressed and mitigated in order for any viable microgrid development plan to succeed.

Ongoing Political Risk

As of mid-summer 2016, delayed presidential elections have led to a protracted political crisis in Haiti. Uncertainty around the national political cycle and outcomes is leading to widespread hesitation on the part of international organizations and external funders as well as difficulty in gaining clarity in the regulatory environment.

Regulatory Risk

After the completion of the legal analysis performed for this report, the then-outgoing President Michelle Martelly issued new, wide-reaching energy decrees, published in Haiti's *Le Moniteur* newspaper on February 3, 2016. The nearly 60 pages of decrees have the potential to upend the existing legal and regulatory environment for all aspects of the electricity sector in Haiti. The decrees themselves have positive and potentially negative implications for rural microgrid development in Haiti, however uncertainty around if and how the decrees will be implemented is currently posing the greatest set of challenges. For example, the Decrees name and give broad authority to a new national electricity regulatory body, but as of the release of this report, no body had been formed, and no funding for the establishment of such a regulator had been allocated. According to the decrees, the new regulator, if indeed it is created, would have purview over all companies offering service throughout the country, and would require companies to obtain a concession or a license.

Process Risk

Beyond the large and immediate political and regulatory risks, both of which may be solved by a smooth election and a productive legislative session, process risk remains high for microgrid development in Haiti. Best practices for microgrid development remain anecdotal, and, while EarthSpark, Limye Pa'w, and NRECA have all gained some experience in the development of energy access microgrids in Haiti in recent years, there remain many gaps in the standardization of development and operation processes. From logistics to customs to legal structures, technology, and community engagement, many problems were encountered throughout the development of the recent microgrids in Haiti, and likely more unknown issues remain to be discovered during the development phase of the next grids. More good examples of successful microgrids in Haiti are likely necessary before developers will be able to attract investment capital to achieve microgrid development at scale.

Methodology

The microgrid market survey was undertaken by 40 researchers hailing mostly from Haiti, the US, and Canada. The researchers were paired into teams of two, spending four days to one week in each town. Four Regional Coordinators handled logistics for ten researchers each. The surveys were designed by a team of

anthropologists, microgrid consultants, and energy policy advisors, who have experience with the Haitian energy and cultural context. Each research team used two Android devices equipped with Open Data Kit to undertake five different survey types: political, community organization, community leader, business, and household. Surveys focused on the following:

- Political interview: presence of organizations, how to contact town leaders, major energy users, existence of infrastructure
- Community Organization interview: organizational activities, presence of NGOs and diaspora groups, major economic drivers of town, major energy users in town, existence of town infrastructure
- Community Leader interview: major economic drivers of town, presence of organizations (community organizations, diaspora organizations, NGOs), major energy users in town, existence of town infrastructure
- Business interview: energy use, appliance ownership, business type
- Household interview: energy use, appliance ownership

Researchers were teamed with a local guide in each town to connect them with the identified leaders. After meeting with leaders, researchers interviewed the businesses in the town, and then used the remainder of the time to complete household interviews. In addition, the researchers took two walk-throughs of the town: one in the daytime and another in the nighttime. Upon completion of the town surveys, the researchers filled out a summary report of the town research before traveling to the next town.

Additionally, an in-house geospatial analysis was undertaken of each of the towns to determine the following: estimate of potential connections / number of buildings, building density, and flood risk.

Results and Analysis

Legal Landscape Analysis

This project analyzed the relevant laws, regulations and decrees relevant to micro-grid development and operation, outlining the potential benefits and challenges. The full analysis can be found in the appendix of this report, in the section *Legal Analysis*. However, as noted in the *Regulatory Risk* subsection of this report, the legal landscape has been potentially upended by the release of new energy decrees since this analysis was conducted. The landscape remains in a state of flux, requiring regular review and interpretation.

Town Rankings, Version 1

After the completion of the data collection process, the town ranking methodology was developed. However, scoring can change substantially, depending on how different categories are weighted. This report presents two different scoring

methodologies. The raw data will be provided by ESG to Enèji Pwòp, as interpretation of the data may change in the future.

Data Analysis

A quantitative methodology was designed to score and rank each town based upon suitability for microgrid development. The methodology adhered to the following process:

1. Of the over 300 parameters gathered by the surveys in each town, 27 were selected as the most indicative of a town's microgrid suitability.
2. The data value for each parameter was normalized by converting it to a score on a 0-100 scale, called the Normalized Score, where the score is represented as a ratio of the data value in question to the highest value recorded for that parameter. For example, if the population of Anse-Rouge is 12,691 and the highest population recorded among towns was 150,000, then the normalized score is:

   12,691 / 150,000 = **8.5**

3. Each parameter and each category of parameters was weighted on a scale of 1-100 depending on its influence on microgrid suitability, called Parameter Weight and Parameter Category Weight, respectively. (See table below). For example, Population has a Parameter weight of 90 whereas the Presence of a Bank was weighted as 43.

Parameter	Weight
Economics	93
Population	90
Household Energy Costs (G)	83
Large potential customer (max 30)	62
Potential Residential Customers (kW)	78
Formal Business	73
Bank	42
Market days per week	57
Natural Resource Potential	43
Physical Infrastructure	75
Road access quality	80
Port	35
Electrical grid	57
Functional electrical grid	38
Gas station	65
Distributed solar products	57
Hotel quality	43

Parameter	Weight
Political Will	62
Mayor legitimately elected?	57
Budget / Local contribution	63
Municipal Committee	70
Local association	60
Potential Partners	67
Backed government	60
Investor Interest	83
Diaspora / Resident association	43
NGO	33
University and technical school	63

Court / police station	68
car/bike/bus station	45
Renewable energy potential (hydro, wind, solar)	65

The weighted score of a given parameter was calculated by: Parameter Weighted Score = (Normalized Score) * (Parameter Weight) * (Parameter Category Weight) / 10,000

For example, given these inputs for Population in the town of Anse-Rouge:

Normalized Score = 8.5
Parameter Weight = 90
Parameter Category Weight (Economics) = 93

The Parameter Weighted Score is:

= 8.5 * 90 * 93 / 10,000
= 7.1

The Parameter Weighted Score was calculated for all 27 key parameters for each town.
To produce a town's final score, the Parameter Weighted Scores for the 27 key parameters were summed together.
Final scores were ranked from highest to lowest to yield the final results of towns according to suitability for microgrid development. (See appendix for all scores)

Results

With each parameter weighted, scored and totaled, the calculations yielded the final score for each town.

Town	Score	Rank
Limbé	606	1
Petite-Rivière-de-l'Artibonite	598	2
La Victoire	565	3
Desdunes	563	4
Dessalines / Marchand	562	5
Verrettes	560	6
Anse-d'Hainault	556	7
Liancourt	523	8
Belle-Anse	510	9

Town	Score	Rank
Maïssade	485	10
Anse-à-Foleur	483	11
Labadie	481	12
Pilate	465	13
Vallières	462	14
Grande-Rivière-du-Nord	461	15
Luly	456	16
Plaisance-du-Sud	456	17
Côtes-de-Fer	452	18
Dondon	449	19
Anse-Rouge	447	20
Abricot	436	21
Ennery	433	22
Boucan-Carré	430	23
Pointe-à-Raquette	425	24
Pont-sondé	424	25
Pestel	417	26
Les Irois	416	27
Corail	410	28
Fonds-Verrettes	408	29
Ranquitte	405	30
L'Estère	403	31
Arniquet	399	32
Mont-Organisé	398	33
Désarmes	397	34

Town	Score	Rank
Belladères	395	35
Baie-de-Henne	374	36
Roseaux	371	37
Bahon	369	38
Cerca-Carvajal	359	39
Bord de mer de Limonade	349	40
Cornillon	349	41
Arnaud	344	42
Fond-des-Blancs	337	43
Ferrier	334	44
Thomassique	332	45
Anse-à-Pitre	329	46
L'Ïle- à-Vache	329	47
Plaisance	327	48
Terre-Neuve	326	49
Grand-Gosier	324	50
Moron	324	51
Ganthier	312	52
La Tortue	310	53
Perches	309	54
Bas-Limbé	295	55
Bonbon	293	56
Petit Bourg de Port Margot	292	57
Milot	287	58
Chambellan	279	59

Town	Score	Rank
Tiburon	277	60
Gressier	277	61
Fonds-Parisien	273	62
Dame-Marie	265	63
Savanette	264	64
Randel	263	65
Bois Laurence	262	66
Capotille	258	67
Beaumont	255	68
Chantal	249	69
Duchity	249	70
Marfranc	247	71
Mombin-Crochu	239	72
Mare-Rouge	230	73
Thiotte	227	74
Acul-du-Nord	217	75
Paillant	212	76
Carice	207	77
Borgne	202	78
Cazale	145	79
La Vallée-de-Jacmel	143	80
Carcasse	130	81
Port-Margot	90	82
Cahoane	41	83

Note: The following six towns were not assessed under this methodology because sufficient data was not available at the time: Anse-à-Veau, Casse, Cerca-La-Source, Grande Saline, Les Cayemites, and Sainte Suzanne.

Town Rankings, Version 2

Scoring Categories

Scores were assigned to each town for four separate categories.

Category 1: Weekly Business Energy Expenditures

Interviews were conducted of the major businesses in each town. The interview questions included the cost of gasoline, diesel, kerosene, and candles that were used by each business on a weekly basis. The sum of these weekly expenditures has been assigned a score out of a total possible 20 points for each town.

Category 2: Total Weekly Energy Expenditures and Fuel Consumption

Total energy expenditures were based upon two metrics: 1) measured weekly expenditures, and 2) estimated expenditures. The measured weekly expenditures were a sum of data regarding the cost of gasoline, diesel, kerosene, and candles used by all households, businesses, and community organizations that were interviewed. Geospatial analysis was undertaken to approximate the number of potential connections in each town. In order to estimate overall energy expenditures for the town, the average household weekly energy expenditure was assigned for those potential connections not interviewed.

Fuel consumption was based upon gallons of gasoline and diesel used each week by each town's large energy consumers.

The score for Category 2 was out of a potential 10 points.

Category 3: Economic and Energy Potential

This category looked at business size and potential, NGO presence, strength of local organizations, diaspora presence, town size and density, and presence of existing electricity infrastructure. The total score for Category 3 was out of a possible 19 points.

Category 4: Ease of Access and Flood Risk

This category was based on an assessment of the accessibility of the town, including the condition of roads and potential for year-round access. Additionally, points were awarded for towns that were not in low-lying areas near bodies of water in order to account for the risk of flooding. The total possible score for Category 4 was 10 points.

Scoring Results

The following table lists the scores for each town, including the score by category and the total score. All 89 towns are ranked according to total score, based upon their potential for development of a viable micro-grid.

Table 3 - Scores for Each Town

Town Name	Category 1	Category 2	Category 3	Category 4	Total Score
Dessalines / Marchand	20	10	18	10	**58**
Verrettes	20	10	17	8	**55**
Les Irois	20	10	16	8	**54**
L'Estère	20	10	14	8	**52**
Limbé	16	10	17	8	**51**
Petite-Rivière-de-l'Artibonite	16	10	17	6	**49**
Cerca-Carvajal	12	9	17	10	**48**
Fond-des-Blancs	20	10	10	8	**48**
Fonds-Parisien	20	6	14	6	**46**
Anse-d'Hainault	12	7	17	8	**44**
Bas-Limbé	12	7	16	6	**41**
Beaumont	12	7	12	10	**41**
Perches	12	8	11	10	**41**
Belladères	8	9	13	10	**40**
Desdunes	4	7	18	10	**39**
Dame-Marie	8	8	16	6	**38**
Désarmes	8	7	13	10	**38**
Liancourt	4	10	15	8	**37**
Milot	4	6	15	10	**35**
Anse-Rouge	4	7	17	6	**34**
Maïssade	8	6	16	4	**34**
Mare-Rouge	8	6	16	4	**34**
Belle-Anse	8	7	14	4	**33**

Town Name	Category 1	Category 2	Category 3	Category 4	Total Score
Ennery	4	6	13	10	**33**
Côtes-de-Fer	8	8	12	4	**32**
Vallières	12	4	10	6	**32**
Acul-du-Nord	4	5	14	8	**31**
Anse-à-Pitre	4	4	17	6	**31**
Grande-Rivière-du-Nord	4	6	16	4	**30**
Moron	4	8	14	4	**30**
Thomassique	4	5	15	6	**30**
Arnaud	4	6	11	8	**29**
Cerca-La-Source	4	4	15	6	**29**
Ferrier	4	3	14	8	**29**
Ganthier	4	3	12	10	**29**
Pont-sondé	4	5	16	4	**29**
Sainte Suzanne	4	3	14	8	**29**
Anse-à-Veau	4	5	13	6	**28**
Bord de mer de Limonade	4	5	13	6	**28**
La Tortue	8	4	12	4	**28**
Luly	4	8	10	6	**28**
Anse-à-Foleur	4	7	14	2	**27**
Arniquet	4	5	10	8	**27**
Boucan-Carré	4	5	12	6	**27**
Paillant	4	4	9	10	**27**
Plaisance	4	5	12	6	**27**
Thiotte	4	5	10	8	**27**

Town Name	Category 1	Category 2	Category 3	Category 4	Total Score
Tiburon	4	6	13	4	**27**
Bonbon	4	4	12	6	**26**
Dondon	4	3	13	6	**26**
Duchity	4	4	10	8	**26**
Pilate	4	4	12	6	**26**
Port-Margot	4	3	13	6	**26**
Borgne	4	3	12	6	**25**
Capotille	4	2	9	10	**25**
Cazale	4	4	13	4	**25**
Labadie	8	3	12	2	**25**
Les Cayemites	4	8	11	2	**25**
Mont-Organisé	4	3	10	8	**25**
Bahon	4	3	13	4	**24**
Baie-de-Henne	4	4	12	4	**24**
Grande Saline	4	3	11	6	**24**
Gressier	4	1	13	6	**24**
L'Ïle- à-Vache	4	5	11	4	**24**
La Vallée-de-Jacmel	4	2	10	8	**24**
Ranquitte	4	2	12	6	**24**
Chantal	4	2	9	8	**23**
Cornillon	4	3	10	6	**23**
Fonds-Verrettes	4	4	11	4	**23**
Mombin-Crochu	4	2	11	6	**23**
Pestel	4	2	13	4	**23**
Plaisance-du-Sud	4	2	9	8	**23**

Town Name	Category 1	Category 2	Category 3	Category 4	Total Score
Pointe-à-Raquette (La Gonâve)	4	3	14	2	**23**
Roseaux	4	5	10	4	**23**
Bois de Laurence	4	2	8	8	**22**
Carice	4	4	8	6	**22**
Grand-Gosier	4	3	11	4	**22**
La Victoire	4	1	11	6	**22**
Marfranc	4	4	10	4	**22**
Terre-Neuve	4	3	8	6	**21**
Casse	4	3	9	4	**20**
Savanette	4	3	11	2	**20**
Abricot	4	2	11	2	**19**
Corail	4	3	10	2	**19**
Randel	4	2	10	2	**18**
Cahouane	4	2	7	4	**17**
Petit Bourg de Port Margot	4	2	7	4	**17**
Carcasse	4	2	8	2	**16**
Chambellan	0	1	9	4	**14**

The map in Figure 1 presents the data graphically, with the larger circles representing the towns with the most favorable conditions for microgrid development. Color coding aligns with circle size. The larger the circle, the darker the shade of green; the smaller the circle, the darker the shade of red.

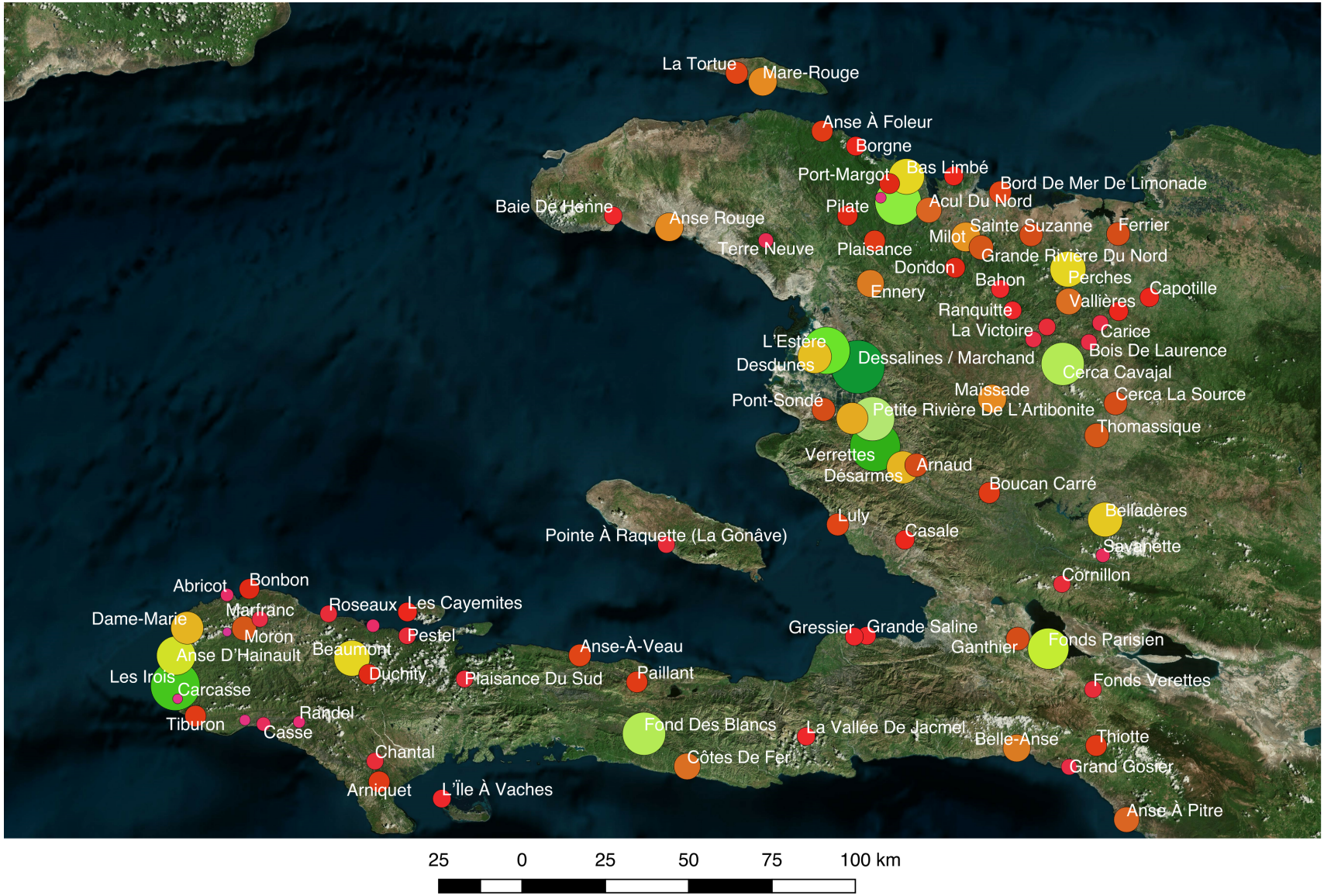

Figure 1 – Overall Microgrid Suitability (Version 2 Town Ranking Methodology) (Map Imagery: Bing)

Towns, Ranked

Table 4 - Town Rankings, using Town Ranking Methodology 2

Town Name	Rank	Town Name	Rank	Town Name	Rank	Town Name	Rank
Dessalines / Marchand	1	Ennery	23	Plaisance	42	Cornillon	67
Verrettes	2	Côtes-de-Fer	25	Thiotte	42	Fonds-Verrettes	67
Les Irois	3	Vallières	25	Tiburon	42	Mombin-Crochu	67
L'Estère	4	Acul-du-Nord	27	Bonbon	49	Pestel	67
Limbé	5	Anse-à-Pitre	27	Dondon	49	Plaisance-du-Sud	67
Petite-Rivière-de-l'Artibonite	6	Grande-Rivière-du-Nord	29	Duchity	49	Pointe-à-Raquette (La Gonâve)	67
Cerca-Carvajal	7	Moron	29	Pilate	49	Roseaux	67
Fond-des-Blancs	7	Thomassique	29	Port-Margot	49	Bois de Laurence	75
Fonds-Parisien	9	Arnaud	32	Borgne	54	Carice	75
Anse-d'Hainault	10	Cerca-La-Source	32	Capotille	54	Grand-Gosier	75
Bas-Limbé	11	Ferrier	32	Cazale	54	La Victoire	75
Beaumont	11	Ganthier	32	Labadie	54	Marfranc	75
Perches	11	Pont-sondé	32	Les Cayemites	54	Terre-Neuve	80
Belladères	14	Sainte Suzanne	32	Mont-Organisé	54	Casse	81
Desdunes	15	Anse-à-Veau	38	Bahon	60	Savanette	81
Dame-Marie	16	Bord de mer de Limonade	38	Baie-de-Henne	60	Abricot	83
Désarmes	16	La Tortue	38	Grande Saline	60	Corail	83
Liancourt	18	Luly	38	Gressier	60	Randel	85
Milot	19	Anse-à-Foleur	42	L'Ïle- à-Vache	60	Cahouane	86
Anse-Rouge	20	Arniquet	42	La Vallée-de-Jacmel	60	Petit Bourg de Port Margot	86
Maïssade	20	Boucan-Carré	42	Ranquitte	60	Carcasse	88
Mare-Rouge	20	Paillant	42	Chantal	67	Chambellan	89
Belle-Anse	23						

Top 41 Towns

This section of the report contains a detailed description of each of the top 41 towns (there was a four-way tie for 38th) assessed under the market study, in order of rank according to Town Ranking Version 2, as well as their suitability and potential challenges moving forward. This section also details what makes these top towns particularly suited to a solar-powered microgrid, as well as some potential challenges to microgrid development moving forward.

Suitability

The top towns that have been identified through this survey exhibit many of the same characteristics that make them potentially ideal sites for solar-powered microgrids. For one, these towns each exhibit a relatively high energy demand. Additionally, many of them have existing energy infrastructure, as well as strong local organizations. These towns are also generally larger, have more potential connections, and have generally high densities.[2] All of these criteria are important for a microgrid to be successful. Additionally, the existence of a potential for business growth is crucial, to ensure that the town is able to afford the cost of a grid going forward.

The project intentionally targeted towns assumed not to already be served by EdH (Electricité d'Haiti), but as the results indicate, many towns were indeed served by EdH. The level of service, however, was often very low, ranging from just a couple of hours per day for a few days per week, to not operating at all.

Dessalines / Marchand, Rank: 1

Dessalines / Marchand is a town of approximately 165,000 people located in the Artibonite department of Haiti. The microgrid survey of Dessalines / Marchand was undertaken from the 18th to 22nd of August, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Dessalines / Marchand are agriculture (rice, onions, and beans) and the businesses, which include hotels, shops, markets, water purifiers, ice-making, gas stations, hospitals, and schools. All of the businesses interviewed in Dessalines / Marchand are connected to the grid and also have their own generators. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200 HTG per gallon for gasoline, 170 HTG per gallon of diesel, and 40-50 HTG per bidon[3] of kerosene. There are approximately 1800

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[2] Generating density maps was particularly time-intensive. Maps are provided for those towns for which time allowed.

[3] A "bidon" is a vessel used to purchase kerosene – the size of a bidon is not standardized and varies from household to household.

buildings that could be potentially connected to a micro-grid in Dessalines / Marchand. The current major energy users in the town are the businesses, the hotels, and the hospital, and some wealthy households.

Table 5 – Energy Expenditures in Dessalines / Marchand

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	234,170
Weekly Household Expenditures	1,143,763
Total Weekly Expenditures	1,377,933
Gasoline and Diesel Consumed Weekly	1,416 gallons

Dessalines / Marchand has a brownfield microgrid, a pre-existing grid which is no longer operational. The microgrid is managed by the national utility, "Electricité d'Haïti" (EdH). All of the businesses and most of the households interviewed are connected to the grid, which runs one or two times per month. Thus, there is some operational energy infrastructure already present in Dessalines / Marchand.

Strength of Community-Based Organizations

There are community-based organizations in Dessalines / Marchand, serving groups of youth, and involved in water, sanitation, and hygiene. Some activities undertaken by NGOs in Dessalines / Marchand include rehabilitation of school buildings, education, and water and sanitation.

Accessibility and Potential Setbacks

Dessalines / Marchand is easily accessible by ground transportation. One of the potential setbacks for the development of a micro-grid in Dessalines / Marchand is the existence of an EdH microgrid.

Verrettes, Rank: 2

Verrettes is a town of approximately 132,000 people located in the Artibonite department of Haiti. The microgrid survey of Verrettes was undertaken from September 9th to 12th, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Verrettes is agriculture (beans, rice, and corn). The businesses interviewed in Verrettes all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200-250 HTG per gallon for gasoline, 165-195 HTG per gallon of diesel, and 40-50 HTG per bidon of kerosene. There are approximately 1000 buildings that could be potentially connected to a micro-grid in Verrettes. The current major energy users in the town are the ice producer and the hotels.

Table 6 – Energy Expenditures in Verrettes

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	287,000
Weekly Household Expenditures	480,000
Total Weekly Expenditures	767,000
Gasoline and Diesel Consumed Weekly	1455 gal

Verrettes has brownfield grid infrastructure that is managed by EdH. Some of the businesses and households interviewed are connected to the grid, but it no longer functions. Thus, there is some energy infrastructure already present in Verrettes.

Strength of Community-Based Organizations

There are three community-based organizations in town, serving women, youth and agricultural technicians, and focusing on development and social and cultural activities. NGOs in town work in sanitation, potable water, and livestock management.

Accessibility and Potential Setbacks

Verrettes is easily accessible by Route 11, which is paved. One potential setback for microgrid development in Verrettes is that it sits on the bank of a small river, which may result in flooding.

Les Irois, Rank: 3

Les Irois has a population of about 21,000 and is located in the Grand'Anse department of Haiti. The microgrid survey of Les Irois was undertaken from the 1st to 6th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Les Irois are fishing and cocoa processing. The businesses interviewed in Les Irois all have their own source of generation, consisting almost of both generators and solar panels. Fuel costs 250 HTG per gallon for gasoline, 157-225 HTG per gallon of diesel, and 25-50 HTG per bidon of kerosene. There are approximately 750 buildings that could be potentially connected to a micro-grid in Les Irois. The current major energy users in the town are the ice producers, cocoa processors and the small stores.

Table 7 – Energy Expenditures in Les Irois

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	130,000
Weekly Household Expenditures	267,000
Total Weekly Expenditures	397,000
Gasoline and Diesel Consumed Weekly	796 gallons

There is a brownfield microgrid in Les Irois, which is managed by a local committee. Many of the businesses and households interviewed reported being connected to it. Electricity is available 2 hours a day, every day.

Strength of Community-Based Organizations

There are six reported community-based organizations in town. Most are focused on social, political and economic development and organization. One is focused on supporting the cocoa processing industry while another focuses on management of the existing grid. NGO activities in Les Irois include: health (Red Cross), developing markets for cocoa products, and training for farmers.

Accessibility and Potential Setbacks

The town is accessible by ground transportation, including large trucks. Political problems appear to hamper management of the current grid, as there are reports of near-violent confrontations when a misunderstanding arises. Additionally, Les Irois is located in a low-lying coastal area, making it susceptible to flooding.

Figure 2 – Potential Connections in Les Irois (Map Imagery: Google Earth, DigitalGlobe)

L'Estère, Rank: 4

L'Estère is a town of approximately 41,000 people located in the Artibonite department of Haiti. The microgrid survey of L'Estère was undertaken from the 20th to 22nd of August, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of L'Estère is agriculture (rice, sorghum, and maize). The businesses interviewed in L'Estère all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200 HTG per gallon for gasoline, and 25 HTG per bidon of kerosene. There are approximately 1000 buildings that could be

potentially connected to a micro-grid in L'Estère. The current major energy users in the town are the hospital and, to a lesser degree, a welding shop and small shops running freezers.

Table 8 – Energy Expenditures in L'Estère

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	86,000
Weekly Household Expenditures	315,000
Total Weekly Expenditures	400,000
Gasoline and Diesel Consumed Weekly	1,200 gal

L'Estère has some brownfield electricity infrastructure. There is electricity that comes from the EdH power plant at Gonaïves, but only 1-2 days a month for a few hours. Some of the businesses and households interviewed are connected to the grid, but very few reported receiving any actual electricity.

Accessibility and Potential Setbacks

Access is possible with large trucks throughout the year. One potential setback to microgrid development in L'Estère is that the town is built along the banks of a river, making it susceptible to flooding.

Limbé, Rank: 5

Limbé is a town of approximately 19,000 people located in the Nord department of Haiti. The microgrid survey of Limbé was undertaken from the 23rd to the 26th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Limbé is agriculture (cassava, rice, sugar cane, pineapple, and corn). The businesses interviewed in Limbé all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200 HTG per gallon for gasoline, 185-200 HTG per gallon of diesel, and 20-70 HTG per bidon of kerosene. There are approximately 1200 buildings that could be potentially connected to a micro-grid in Limbé. The current major energy users in the town are the hotels in the center of town and the health center.

Table 9 – Energy Expenditures in Limbé

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	77,000
Weekly Household Expenditures	249,000
Total Weekly Expenditures	326,000

Gasoline and Diesel Consumed Weekly	476 gal

Limbé is connected to the EdH grid coming out of a generation station in Cap Haïtien. Many of the businesses and households interviewed report being connected to the grid, but not receiving any electricity. Thus, there is some energy infrastructure already present in Limbé.

Strength of Community-Based Organizations

There are a number of community-based organizations in Limbé, focusing on social and cultural activities, economic development, and energy. The NGO presence focuses mainly on agricultural activities.

Accessibility and Potential Setbacks

Transportation accessibility to the town is good year-round, for large trucks as well. One potential setback for the development of a microgrid in Limbé is that it is located on the bank of a river, which may make it susceptible to flooding.

Petite-Rivière-de-l'Artibonite, Rank: 6

Petite-Rivière-de-l'Artibonite is a town of approximately 155,000 people located in the Artibonite department of Haiti. The microgrid survey of Petite-Rivière-de-l'Artibonite was undertaken from September 8th to 11th, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Petite-Rivière-de-l'Artibonite are agriculture (rice, corn, peas, and potatoes) and trade, with a market occurring twice per week. The businesses interviewed in Petite-Rivière-de-l'Artibonite all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200-300 HTG per gallon of gasoline and 40-55 HTG per bidon of kerosene. There are approximately 1200 buildings that could be potentially connected to a micro-grid in Petite-Rivière-de-l'Artibonite. The current major energy user in town is the municipal market.

Table 10 – Energy Expenditures in Petite Rivière de l'Artobinite

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	63,000
Weekly Household Expenditures	141,000
Total Weekly Expenditures	205,000
Gasoline and Diesel Consumed Weekly	456 gal

Petite-Rivière-de-l'Artibonite is served by a grid run by EdH that operates up to two days per week for about 2 hours per day.

Strength of Community-Based Organizations

Three organizations were identified, focusing on issues such as micro-credit, schooling, and trade skills development. The NGO presence in town focuses mainly on health (Red Cross) and running a school.

Accessibility and Potential Setbacks

Road access is good, even for large trucks, year-round. One potential setback for the development of a microgrid in Petite-Rivière-de-l'Artibonite is that it is located on the bank of a river, which may make it susceptible to flooding.

Cerca-Carvajal, Rank: 7

Cerca-Carvajal is a town of approximately 21,000 people located in the Centre department of Haiti. The microgrid survey of Cerca-Carvajal was undertaken from the 2nd to 5th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Cerca-Carvajal are agriculture (beans, pistachio, and corn) and livestock. Almost all of the businesses interviewed in Cerca-Carvajal are connected to the grid and have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 240-250 HTG per gallon for gasoline, 220-250 HTG per gallon of diesel, and 15-30 HTG per bidon of kerosene. There are approximately 900 buildings that could be potentially connected to a micro-grid in Cerca-Carvajal. The businesses are the major energy users in the town.

Table 11 – Energy Expenditures in Cerca-Carvajal

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	48,805
Weekly Household Expenditures	340,820
Total Weekly Expenditures	389,625
Gasoline and Diesel Consumed Weekly	176 gallons

Most of the businesses and households in Cerca-Carvajal report being connected to the grid, which runs 3 days per week, for 5-12 hours per day. This grid is managed by EdH. Thus, there is some operational energy infrastructure already present in Cerca-Carvajal.

Strength of Community-Based Organizations

There is a community-based organization in Cerca-Carvajal, focusing on education. Some activities undertaken by NGOs in Cerca-Carvajal include selling farming materials, education, reforestation, and health support.

Accessibility and Potential Setbacks

Cerca-Carvajal, is easily accessible by any type of ground transportation. One of the potential setbacks for the development of a micro-grid in Cerca-Carvajal is the

presence of EdH and a working grid. Also, Cerca-Carvajal is close proximity of two rivers, making it susceptible to flooding.

Fond-des-Blancs, Rank: 7

Fond-des-Blancs is a town of approximately 8,000 people located in the Sud department of Haiti. The microgrid survey of Fond-des-Blancs was undertaken from the 12th to 14th of August, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Fond-des-Blancs are the market, moto transport, and agriculture (charcoal, corn, and beans). All of the businesses interviewed in Fond-des-Blancs have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline, 250 HTG per gallon of diesel, and 30-60 HTG per bidon of kerosene. There are approximately 300 buildings that could be potentially connected to a micro-grid in Fond-des-Blancs. The current major energy users in the town are the hospital, the hotel, and the school.

Table 12 – Energy Expenditures in Fond-des-Blancs

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	395,000
Weekly Household Expenditures	66,352
Total Weekly Expenditures	461,352
Gasoline and Diesel Consumed Weekly	1,590 gallons

Strength of Community-Based Organizations

There is a community-based organization in Fond-des-Blancs, serving a group of women. The NGO presence in Fond-des-Blancs focuses on health, agriculture, and education.

Accessibility and Potential Setbacks

The road into Fond-de-Blancs is easily accessible, except in the case of heavy rains. Another potential setback for the development of a micro-grid in Fond-des-Blancs is that the buildings are located far away from each other.

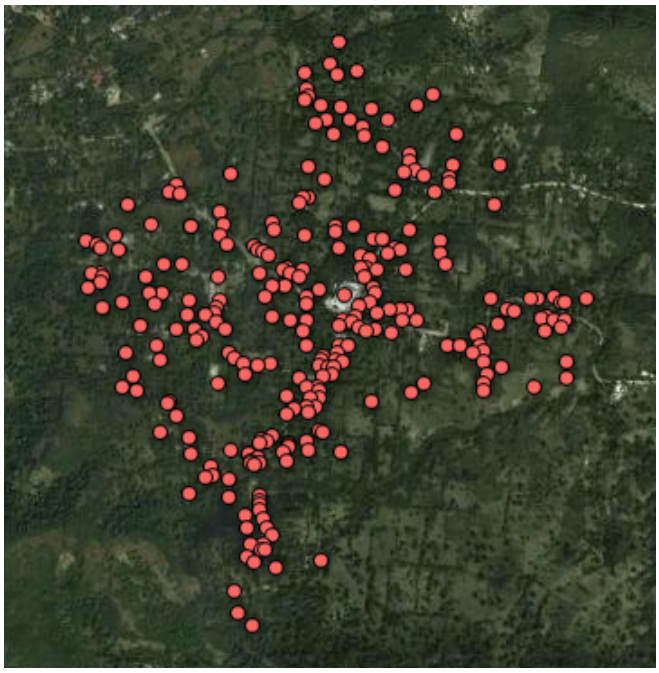

Figure 3 – Potential Connections in Fond-des-Blancs (Map Imagery: Google Earth, DigitalGlobe)

Fonds-Parisien, Rank: 9

Fonds-Parisien is a town of approximately 18,000 people located in the Ouest department of Haiti. The microgrid survey of Fonds-Parisien was undertaken from the 2nd to 4th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Fonds-Parisien are agriculture (cassava, plantains, and papaya), fishing, and commerce. All of the businesses interviewed in Fonds-Parisien are connected to an existing EdH grid and have their own generators. This indicates that there is already a high demand for energy in the business sector. Fuel costs 195 HTG per gallon for gasoline, 200 HTG per gallon of diesel, and 35-50 HTG per bidon of kerosene. There are approximately 550 buildings that could be potentially connected to a micro-grid in Fonds-Parisien. The current major energy users in the town are the factories, hotels, and discos.

Table 13 – Energy Expenditures in Fonds-Parisien

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	468965
Weekly Household Expenditures	65182
Total Weekly Expenditures	534147
Gasoline and Diesel Consumed Weekly	29 gallons

Fonds-Parisien is connected to an EdH grid, managed by an office in Croix-des-Bouquets. Most of the businesses and households interviewed are connected to the

grid, which runs 2-5 days per week for 2-6 hours per day. Thus, there is some operational energy infrastructure already present in Fonds-Parisien.

Strength of Community-Based Organizations

There are two community-based organizations in Fonds-Parisien, serving groups of farmers and women. Some activities undertaken by NGOs in Fonds are distribution of food aid and small solar lighting, as well as involvement in health and education.

Accessibility and Potential Setbacks

Fonds-Parisien is easily accessible by ground transportation. One of the potential setbacks for the development of a micro-grid in Fonds-Parisien is that, as a border town, the population fluctuates frequently, which can be difficult for planning purposes.

Anse-d'Hainault, Rank: 10

Anse-d'Hainault is a town of approximately 23,000 people located in the Sud-Est department of Haiti. The microgrid survey of Anse-d'Hainault was undertaken from the 2nd to 5th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Anse-d'Hainault are small businesses, and the export of cocoa and seafood. Almost all of the businesses interviewed in Anse-d'Hainault have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 230-250 HTG per gallon for gasoline, 175-225 HTG per gallon of diesel, and 12-15 HTG per bidon of kerosene. There are approximately 900 buildings that could be potentially connected to a micro-grid in Anse-d'hainault. The current major energy user in the town is the Mayor's house.

Table 14 – Energy Expenditures in Anse-d'Hainault

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	43,796
Weekly Household Expenditures	55,865
Total Weekly Expenditures	99,661
Gasoline and Diesel Consumed Weekly	259 gallons

Anse-d'Hainault is served by a brownfield microgrid, managed by EdH. Some of the businesses and households interviewed are connected to the grid, but it only runs during important holidays. Thus, there is some energy infrastructure already present in Anse-d'Hainault.

Strength of Community-Based Organizations

There are community-based organizations in Anse-d'Hainault, serving groups of farmers and fishers, providing access to markets. Some activities undertaken by

NGOs in Anse-d'Hainault include running cocoa cooperatives, providing educational support, and water treatment to prevent cholera.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Anse-d'Hainault is political – the interviews yielded some documentation of major disagreements between the mayor and the deputy,that have resulted in the current status of the brownfield microgrid not running. Also, parts of Anse-d'Hainault are located in a low-lying coastal area, making it susceptible to flooding.

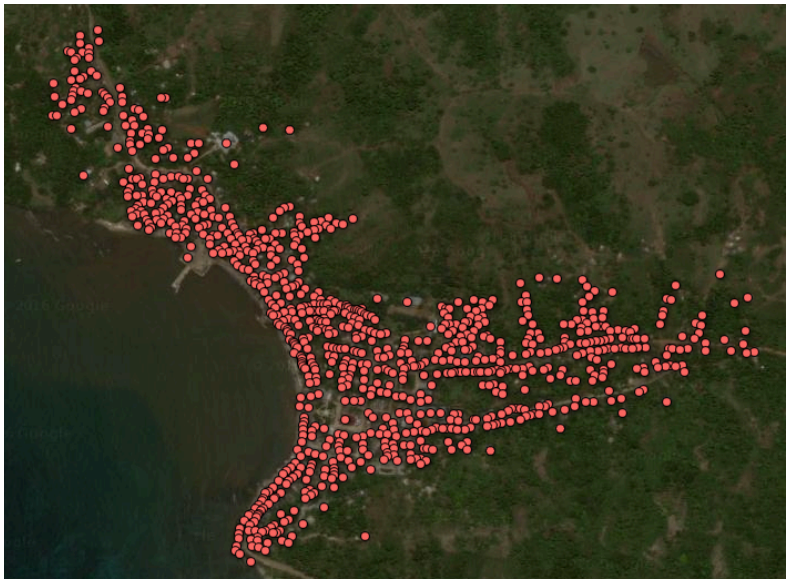

Figure 4 – Potential Connections in Anse-d'Hainault (Map Imagery: Google Earth, DigitalGlobe)

Bas-Limbé, Rank: 11

Bas-Limbé is a town of approximately 19,000 people located in the Nord department of Haiti. The microgrid survey of Bas-Limbé was undertaken from the 19th to 21st of August, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Bas-Limbé are agriculture (plantains, corn, and sugar cane), raising livestock, and businesses. All of the businesses interviewed in Bas-Limbé have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200-750 HTG per gallon for gasoline, 175 HTG per gallon of diesel, and 60-250 HTG per bidon of kerosene. There are approximately 2000 buildings that could be potentially connected to a micro-grid in Bas-Limbé. The current major energy users in the town are the hotels, a bakery, fishermen (cold storage), mills, a cinema, and a butcher.

Table 15 – Energy Expenditures in Bas-Limbé

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	42,615
Weekly Household Expenditures	726,264
Total Weekly Expenditures	768,879
Gasoline and Diesel Consumed Weekly	85 gallons

One of the households interviewed in Bas-Limbé is connected to the EdH grid, but does not receive any electricity. Thus, there is some energy infrastructure already present in Bas-Limbé.

Strength of Community-Based Organizations

There are two community-based organizations in Bas-Limbé, serving groups of farmers, and providing education, training, and soil conservation. Activities undertaken by NGOs in Bas-Limbé are in the education, agriculture, and health sectors.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Bas-Limbé is the existence of a grid that is occasionally running. Bas-Limbé is generally accessible by ground transportation, but the road is located on the bank of a river and therefore could be impassible in the event of flooding.

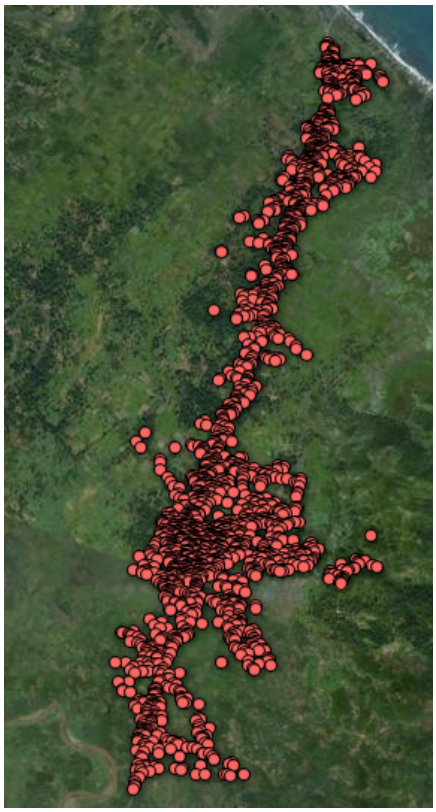

Figure 5 – Potential Connections in Bas-Limbé (Map Imagery: Google Earth, DigitalGlobe)

Beaumont, Rank: 11

Beaumont is a town of approximately 29,000 people located in the Grand-Anse department of Haiti. The microgrid survey of Beaumont was undertaken from the 11th to 15th of August, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Beaumont are the businesses, including 5 mills, a morgue, 3 hotels, and 3 phone charging stations. All of the businesses interviewed in Beaumont have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline, 200-250 HTG per gallon of diesel, and 150-200 HTG per bidon of kerosene. There are approximately 500 buildings that could be potentially connected to a micro-grid in Beaumont. The current major energy users in the town are businesses (particularly those with cold storage), the mills, and post-processing of agricultural produce.

Table 16 – Energy Expenditures in Beaumont

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	56,065
Weekly Household Expenditures	39,188
Total Weekly Expenditures	95,253
Gasoline and Diesel Consumed Weekly	208 gallons

Strength of Community-Based Organizations

There are a few community-based organizations in Beaumont, which undertake soil conservation, educational support, and organization of social activities. NGO activities include support for agricultural post-processing of coffee.

Accessibility and Potential Setbacks

Beaumont is accessible by ground transportation year-round. It is expected that travel to Beaumont in large trucks will become even easier upon completion of road works on Route 7. No major setbacks to microgrid development were determined as part of the survey.

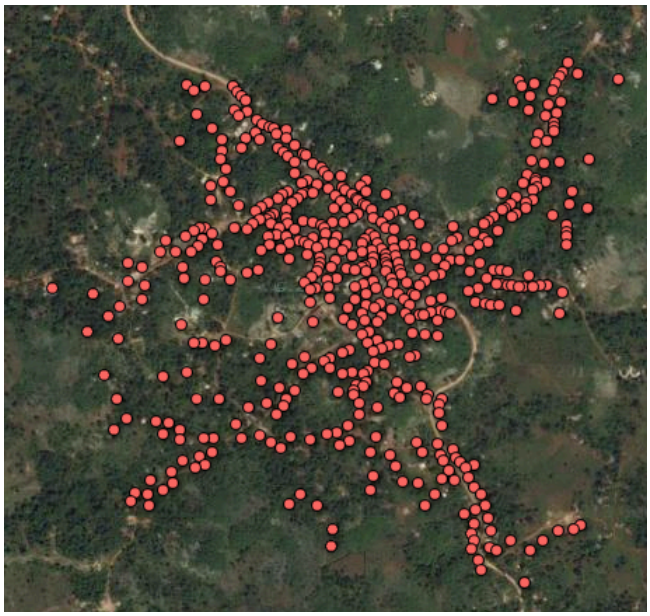

Figure 6 – Potential Connections in Beaumont (Map Imagery: Google Earth, DigitalGlobe)

Perches, Rank: 11

Perches is a town of approximately 10,000 people located in the Nord-Est department of Haiti. The microgrid survey of Perches was undertaken September 8th to 12th, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Perches are agriculture and trade. The businesses interviewed in Perches all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200 HTG per gallon of gasoline, and 220 HTG per gallon of diesel.There are approximately 350 buildings that could be potentially connected to a micro-grid in Perches. The current major energy users in the town are a materials shop and a disco.

Table 17 – Energy Expenditures in Perches

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	47,000
Weekly Household Expenditures	213,000
Total Weekly Expenditures	261,000
Gasoline and Diesel Consumed Weekly	138 gal

Strength of Community-Based Organizations

Five community-based organizations, with over 300 members, were identified. The organizations address cultural and agribusiness matters. NGOs in town focus on agriculture, soil conservation, reforestation, and water treatment.

Accessibility and Potential Setbacks

Road accessibility is good, with no apparent challenges that would prevent a truck from accessing the town's center. Perches is located on the bank of a river, making it potentially susceptible to flooding.

Belladères, Rank: 14

Belladères is a town of approximately 79,000 people located in the Centre department of Haiti. The microgrid survey of Belladères was undertaken from the 29th of September to the 3rd of October, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Belladères are fishing and selling used clothing and appliances. Almost all of the businesses interviewed in Belladères have a grid connection in addition to their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 195-250 HTG per gallon for gasoline, 150-175 HTG per gallon of diesel, and 30-50 HTG per bidon of kerosene. There are approximately 400 buildings that could be potentially connected to a micro-grid in Belladères. The current major energy users in the town are the restaurant/bars, bakery, hotel, schools, public administrative buildings, and discos.

Table 18 – Energy Expenditures in Belladères

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	38,884
Weekly Household Expenditures	229,024
Total Weekly Expenditures	267,908
Gasoline and Diesel Consumed Weekly	151 gallons

Belladères is served by the EdH grid. Some of the businesses and households interviewed are connected to the grid, which runs 4-10 hours per day, 7 days a week. Thus, there is some operational energy infrastructure already present in Belladères.

Strength of Community-Based Organizations

There are two community-based organizations in Belladères, serving groups of women and farmers, and engaging in sanitation activities. NGOs in Belladères focus on health, agriculture, and education.

Accessibility and Potential Setbacks

Belladères is easily accessible by a paved road. One of the potential setbacks for the development of a micro-grid in Belladères is the existence of a working grid. Also, Belladères has a river running through it, making it susceptible to flooding.

Desdunes, Rank: 15

Desdunes is a town of approximately 34,000 people located in the Artibonite department of Haiti. The microgrid survey of Desdunes was undertaken from the 19th to 22nd of August, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Desdunes is the business community. There are a number of businesses selling food, construction materials, morgues, and there are also a number of businesses offering wire transfer services. In addition to a sporadic grid connection, almost all of the businesses interviewed in Desdunes have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200-240 HTG per gallon for gasoline and 25-200 HTG per bidon of kerosene. There are approximately 1200 buildings that could be potentially connected to a micro-grid in Desdunes. The current major energy user in the town is the morgue.

Table 19 – Energy Expenditures in Desdunes

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	16,023
Weekly Household Expenditures	285,217
Total Weekly Expenditures	301,239
Gasoline and Diesel Consumed Weekly	86 gallons

Desdunes is partially served by an EdH grid. All of the businesses and most of the households interviewed are connected to the grid, which runs sporadically. It may turn on for one day and then be off for months at a time. Thus, there is some energy infrastructure already present in Desdunes.

Strength of Community-Based Organizations

There is a community-based organization in Desdunes to counter violence against women. Some activities undertaken by NGOs in Desdunes include training around health, environment, culture, and education, as well as sanitation.

Accessibility and Potential Setbacks

Desdunes is easily accessible by ground transportation. One of the potential setbacks for the development of a micro-grid in Desdunes is the presence of an EDH grid that only runs occasionally. Also, Desdunes is located in a low-lying coastal area, making it susceptible to flooding.

Dame-Marie, Rank: 16

Dame-Marie is a town of approximately 27,000 people located in the Grand-Anse department of Haiti. The microgrid survey of Dame-Marie was undertaken from the 1st to 6th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Dame-Marie are fishing, agriculture (cocoa, coffee, yams, breadfruit, and malanga), and raising livestock. Most of the businesses interviewed in Dame-Marie have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline, 200 HTG per gallon of diesel, and 30-50 HTG per bidon of kerosene. There are approximately 600 buildings that could be potentially connected to a micro-grid in Dame-Marie. The current major energy users in the town are Digicel and Natcom, the hotel, welders, the morgues, the hospital, and the churches.

Table 20 – Energy Expenditures in Dame-Marie

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	26,330
Weekly Household Expenditures	147,154
Total Weekly Expenditures	173,484
Gasoline and Diesel Consumed Weekly	154 gallons

Dame-Marie is served by a small, local EdH grid. Some of the businesses and households interviewed are connected to the grid, but do not receive any electricity. Thus, there is some energy infrastructure already present in Dame-Marie.

Strength of Community-Based Organizations

There are two community-based organizations in Dame-Marie, serving groups of farmers, fishers, and organizing cultural activities. Some activities undertaken by NGOs in Dame-Marie include training and support for cocoa farmers, safety training for fishermen, and soil conservation.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Dame-Marie noted during the course of the survey was political instability. Additionally, the researchers noted that there was not a lot of sunlight in Dame-Marie, and that the town is difficult to access at the moment due to road construction. Also, Dame-Marie is located in a low-lying coastal area, making it susceptible to flooding.

Figure 7 – Potential Connections in Dame-Marie (Map Imagery: Google Earth, DigitalGlobe)

Désarmes, Rank: 16

Désarmes is a town located in the Nippes department of Haiti. The microgrid survey of Désarmes was undertaken from the 28th of August to 3rd of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Désarmes are the market (Tuesday and Friday), transportation (hub for motos and tapap), rice production, credit union, and stores/businesses. Most of the businesses interviewed in Désarmes have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200 HTG per gallon for gasoline, 175 HTG per gallon of diesel, and 30-60 HTG per bidon of kerosene. There are approximately 800 buildings that could be potentially connected to a micro-grid in Désarmes. The current major energy user in the town is the gas station.

Table 21 – Energy Expenditures in Désarmes

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	21,400
Weekly Household Expenditures	170,737
Total Weekly Expenditures	192,137
Gasoline and Diesel Consumed Weekly	132 gallons

Désarmes is the site of a defunct microgrid. One of the households interviewed is connected to the grid, but it no longer functions. Thus, there is some energy infrastructure already present in Désarmes.

Strength of Community-Based Organizations

There are two community-based organizations in Désarmes, serving groups of youth and farmers, and taking part in education and the construction of canals.

Some activities undertaken by NGOs in Désarmes include soil conservation, reforestation, and road maintenance.

Accessibility and Potential Setbacks

Désarmes is easily accessible year-round. One of the potential setbacks for the development of a micro-grid in Désarmes is theft of solar panels – according to the residents of the town this is already a problem.

Liancourt, Rank: 18

Liancourt is a town of approximately 15,000 people located in the Artibonite department of Haiti. The microgrid survey of Liancourt was undertaken August 8-12, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Liancourt are agriculture and trade. Three times a week, there is a large market. About half of the businesses interviewed reported owning a generator. Fuel costs approximately 190 HTG per gallon for gasoline. There are approximately 1200 buildings that could be potentially connected to a micro-grid in Liancourt. The current major energy users in the town are the ice factory, and a radio/television station.

Table 22 – Energy Expenditures in Liancourt

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	6,700
Weekly Household Expenditures	356,000
Total Weekly Expenditures	362,700
Gasoline and Diesel Consumed Weekly	1,056 gal

Strength of Community-Based Organizations

There was only one reported community-based organization in town, a cooperative supporting agricultural producers. The NGO presence in town focuses on potable water and agriculture.

Accessibility and Potential Setbacks

The town is accessible, and the road is reported to be of sufficient quality, throughout the year, for trucks to pass. Liancourt is located near a river, making it susceptible to flooding.

Milot, Rank: 19

Milot is a town of approximately 29,000 people located in the Nord department of Haiti. The microgrid survey of Milot was undertaken from the Aug 31st to Sep 4th, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Milot is tourism, thanks to the proximity to historical sites. The city also has a daily market, hotels, water treatment facility and other small informal activities. The businesses interviewed in Milot all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200 HTG per gallon for gasoline, 157 HTG per gallon for diesel, and 25 HTG per bidon of kerosene. There are approximately 650 buildings that could be potentially connected to a micro-grid in Milot. The current major energy users in the town are the hotel, water treatment facility and the hospital.

Table 23 – Energy Expenditures in Milot

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	17,000
Weekly Household Expenditures	181,000
Total Weekly Expenditures	200,000
Gasoline and Diesel Consumed Weekly	92 gallons

Milot is partially served by an EdH grid. It runs 2-5 days per week for about 4 hours per day. Only a few businesses and households are connected.

Strength of Community-Based Organizations

Only one community-based organization was identified. It's a women's group that promotes crafts, such as embroidery, handicrafts and trade. NGOs in town work on paving roads, education, and agriculture.

Accessibility and Potential Setbacks

One of the potential setbacks is that EdH already operates in this town, albeit a grid that operates only intermittently. Additionally, Milot is located on the bank of a river, increasing the likelihood of flooding. In terms of accessibility, the road is in a good state, and accessible by truck year-round.

Anse-Rouge, Rank: 20

Anse-Rouge is a town of approximately 40,000 people located in the Artibonite department of Haiti. The microgrid survey of Anse-Rouge was undertaken from the 22nd to 25th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Anse-Rouge are salt mining and agriculture (corn, millet, and watermelon). Most of the businesses interviewed in Anse-Rouge have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 235-300 HTG per gallon for gasoline, 200-230 HTG per gallon of diesel, and 40-50 HTG per bidon of kerosene. There are approximately 1500 buildings that could be potentially connected to a micro-grid in Anse-Rouge. The current major energy users in the town are the churches, Oxfam, the clinic, the morgue, and a hotel/restaurant.

Table 24 – Energy Expenditures in Anse-Rouge

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	19,375
Weekly Household Expenditures	394,281
Total Weekly Expenditures	413,656
Gasoline and Diesel Consumed Weekly	94 gallons

Anse-Rouge has a brownfield microgrid, managed by the mayor's office. A handful of the businesses and households interviewed are connected to the grid, but it no longer functions. Thus, there is some energy infrastructure already present in Anse-Rouge.

Strength of Community-Based Organizations

There are community-based organizations in Anse-Rouge, serving groups of salt miners and women. Some activities undertaken by NGOs in Anse-Rouge include providing food aid and soil conservation.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Anse-Rouge is the state of the roads leading into the town. The roads are accessible, but mostly unpaved, and sometimes difficult to navigate. Also, Anse-Rouge is located in a low-lying coastal area, making it susceptible to flooding.

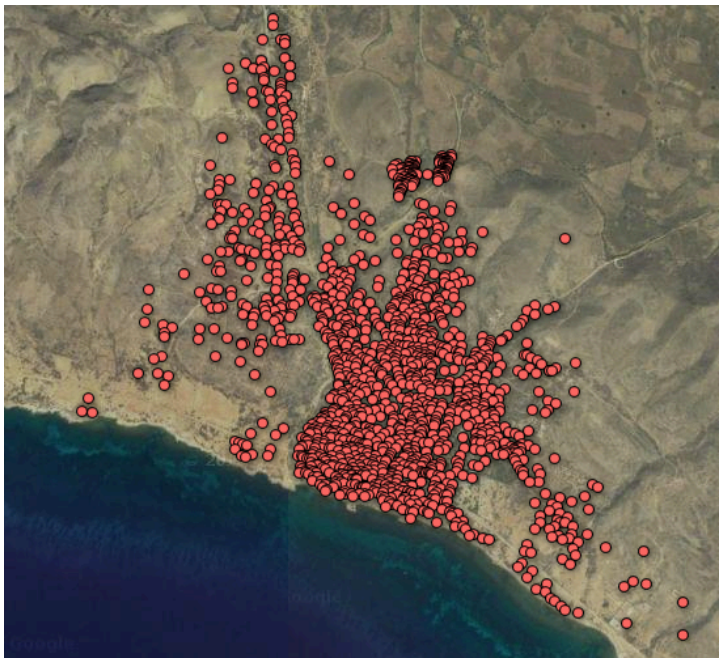

Figure 8 - Potential Connections in Anse-Rouge (Map Imagery: Google Earth, DigitalGlobe)

Maïssade, Rank: 20

Maïssade is a town of approximately 53,000 people located in the Centre department of Haiti. The microgrid survey of Maïssade was undertaken from the 1st to the 5th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Maïssade is agriculture (maize, sugarcane, cassava, and beans). The businesses interviewed in Maïssade all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200-250 HTG per gallon for gasoline, 250 HTG per gallon of diesel, and 30 HTG per bidon of kerosene. There are approximately 1000 buildings that could be potentially connected to a micro-grid in Maïssade. The current major energy users in the town are the hotels, hospital, cinder block manufacturer, radio station, and gas station.

Table 25 – Energy Expenditures in Maissade

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	28,000
Weekly Household Expenditures	124,000
Total Weekly Expenditures	151,000
Gasoline and Diesel Consumed Weekly	95 gallons

Maïssade has a brownfield microgrid managed by EdH. Some of the businesses and households interviewed are connected to the grid, but it only runs 1-2 days per week, and for 6-12 hours at a time. Thus, there is some energy infrastructure already present in Maïssade.

Strength of Community-Based Organizations

There are a number of community-based organizations in Maïssade serving educational interests and micro-credit needs. There is also an NGO in town focusing on nutrition and managing a school cafeteria.

Accessibility and Potential Setbacks

EdH is operating in this town, which could be a potential setback to construction of a microgrid. In terms of accessibility, the roads in town are wide enough and of sufficient quality for trucks. However, the roads leading to the town are rougher, yet not totally inaccessible. Furthermore, several rivers require fording, which could present a barrier during the rainy season if river levels rise too far.

Mare-Rouge, Rank: 20

Mare-Rouge is a town located in the Nord-Ouest department of Haiti. The microgrid survey of Mare-Rouge was undertaken from the 15th to the 19th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Mare-Rouge is commerce, with a particular focus on the sale of construction materials. The businesses interviewed in Mare-Rouge all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline and 30-50 HTG per bidon of kerosene. There are approximately 800 buildings that could be potentially connected to a micro-grid in Mare-Rouge. The current major energy users in the town are the restaurants, morgue, and the church.

Table 26 – Energy Expenditures in Mare-Rouge

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	26,000
Weekly Household Expenditures	8,000
Total Weekly Expenditures	34,000
Gasoline and Diesel Consumed Weekly	130 gallons

Strength of Community-Based Organizations

There are a couple of community-based organizations, mainly focused on socio-economic factors, including childhood development and micro-lending. NGOs in town focus on education, and agriculture.

Accessibility and Potential Setbacks

Mare-Rouge is accessible only by boat, as it is on an island. The road is of moderate quality, but the presence of clay on the road surface may complicate access in the rainy season. The town is located in a low-lying coastal area, making it susceptible to storms and flooding.

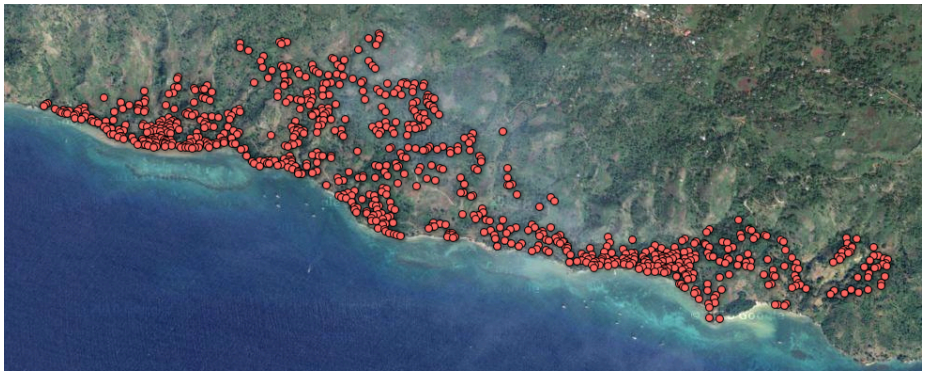

Figure 9 - Potential Connections in Mare-Rouge (Map Imagery: Google Earth, DigitalGlobe)

Belle-Anse, Rank: 23

Belle-Anse is a town of approximately 69,000 people located in the Sud-Est department of Haiti. The microgrid survey of Belle-Anse was undertaken from the 3rd to 5th of August, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Belle-Anse are fishing and selling soft drinks. Almost all of the businesses interviewed in Belle-Anse are connected to the grid and have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 230-250 HTG per gallon for gasoline, 200 HTG per gallon of diesel, and 20-30 HTG per bidon of kerosene. There are approximately 400 buildings that could be potentially connected to a micro-grid in Belle-Anse. The current major energy users in the town are the fisheries, nightclubs, shops selling cold drinks, the churches, and two Sapibon factories.

Table 27 – Energy Expenditures in Belle-Anse

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	34,495
Weekly Household Expenditures	93,266
Total Weekly Expenditures	127,761
Gasoline and Diesel Consumed Weekly	182 gallons

Belle-Anse has a brownfield microgrid, managed by EdH. Most of the businesses and households interviewed are connected to the grid, which runs 2-4 hours per day, 7 days a week. Thus, there is some operational energy infrastructure already present in Belle-Anse.

Strength of Community-Based Organizations

There are a number of community-based organizations in Belle-Anse, including multiple fishing associations, as well as those serving groups of women and youth. NGOs in Belle-Anse focus on support for fishing, nutrition, sanitation, and biodiversity protection.

Accessibility and Potential Setbacks

Belle-Anse is accessible by two roads – one from Jacmel and the other from Port-au-Prince; both are unpaved. It is possible to drive large trucks on the roads but it is difficult and requires a driver familiar with the route. One of the potential setbacks noted for a solar micro-grid Belle-Anse is that there is not a lot of sunlight that reaches the town during the rainy season. Also, Belle-Anse is located in a low-lying coastal area, making it susceptible to flooding.

Ennery, Rank: 23

Ennery is a town of approximately 47,000 people located in the Artibonite department of Haiti. The microgrid survey of Ennery was undertaken from the 19th to 22nd of August, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Ennery are agriculture (beans, corn, millet, plantains, and mangoes) and the raising of livestock. All of the businesses interviewed in Ennery have either a grid connection or their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200 HTG per gallon for gasoline, 175 HTG per gallon of diesel, and 35-70 HTG per bidon of kerosene. There are approximately 500 buildings that could be potentially connected to a micro-grid in Ennery. The current major energy users in the town are the discos, the hotel, the shops selling cold drinks, the welders, the churches, the hospital, and the schools.

Table 28 – Energy Expenditures in Ennery

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	11,053
Weekly Household Expenditures	182,911
Total Weekly Expenditures	193,964
Gasoline and Diesel Consumed Weekly	58 gallons

Ennery has a brownfield microgrid which is managed by EdH. Some of the businesses and households interviewed are connected to the grid, which runs 4-7 days per week, for 12-18 hours per day. Thus, there is some operational energy infrastructure already present in Ennery.

Strength of Community-Based Organizations

There are community-based organizations in Ennery, focusing on education for vulnerable children and serving groups of women and farmers. Some activities

undertaken by NGOs in Ennery include health, education, potable water, and agriculture.

Accessibility and Potential Setbacks

Ennery is easily accessible by land transportation. One of the potential setbacks noted during the survey was a very high level of unemployment, which could be a hindrance to the ability to pay for electricity. Also, the existence of a working grid in the area may be a potential setback. Also, Ennery is located near a river, making it susceptible to flooding.

Côtes-de-Fer, Rank: 25

Côtes-de-Fer is a town of approximately 33,000 people located in the Sud-Est department of Haiti. The microgrid survey of Côtes-de-Fer was undertaken from the 12th to 16th of August, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Côtes-de-Fer are businesses selling soft drinks, cosmetic shops, and a small restaurant. Almost all of the businesses interviewed in Côtes-de-Fer have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200-275 HTG per gallon for gasoline, 225-250 HTG per gallon of diesel, and 25-50 HTG per bidon of kerosene. There are approximately 300 buildings that could be potentially connected to a micro-grid in Côtes-de-Fer. The current major energy users in the town are wealthy households.

Table 29 – Energy Expenditures in Côtes-de-Fer

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	21,213
Weekly Household Expenditures	182,555
Total Weekly Expenditures	203,768
Gasoline and Diesel Consumed Weekly	103 gallons

Côtes-de-Fer has a brownfield microgrid with a generator, but there is no one purchasing fuel for the grid so it is no longer running. Some of the businesses and households interviewed are connected to the grid, but receiving no electricity. Thus, there is some energy infrastructure already present in Côtes-de-Fer.

Strength of Community-Based Organizations

Some activities undertaken by NGOs in Côtes-de-Fer include building houses, education, and agriculture.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Côtes-de-Fer is accessibility – the town is somewhat difficult to access currently as a result of road

construction. Also, Côtes-de-Fer is located in a low-lying coastal area, making it susceptible to flooding.

Figure 10 – Potential Connections in Côtes-de-Fer (Map Imagery: Google Earth, DigitalGlobe)

Vallières, Rank: 25

Vallières is a town with a population of about 21,000. It is located in the Nord-Est department of Haiti. The microgrid survey of Vallières was conducted from the 22nd to 26th of September, 2015.

Energy Expenditures and Business Development Potential

Agriculture (beans, corn, and coffee) and trade are the major economic activities in Vallières. Most of the businesses interviewed in Vallières have their own source of generation, whether either generators or solar panels. This indicates a relatively high energy demand in the business sector. Fuel costs 250 - 500 HTG per gallon for gasoline, and 20 - 80 HTG per bidon of kerosene. There are approximately 300 buildings that could be potentially connected to a micro-grid in this town. Vallières' major energy consumer is a radio station.

Table 30 – Energy Expenditures in Vallières

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	49,425
Weekly Household Expenditures	44,619
Total Weekly Expenditures	94,044
Gasoline and Diesel Consumed Weekly	17 gallons

Strength of Community-Based Organizations

There are two community-based organizations in Vallières, focusing on agricultural and environmental activities, such as reforestation and protection of local waterways. Some activities undertaken by NGOs in Vallières include soil

conservation and reforestation, school building and educational programs, and water and sanitation.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a microgrid in Vallières is the narrow mountainous roads which have deteriorated due to rain, inhibiting truck access into the town. The proximity of Vallières to a river also makes it susceptible to flooding.

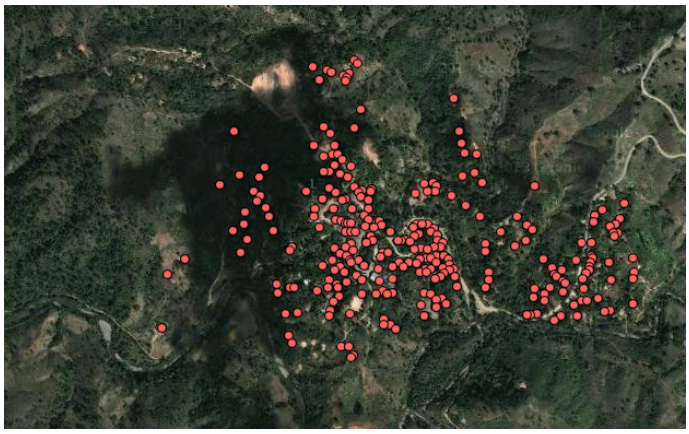

Figure 11 - Potential Connections in Vallières (Map Imagery: Google Earth, DigitalGlobe)

Acul-du-Nord, Rank: 27

Acul-du-Nord is a town of approximately 50,000 people located in the Nord department of Haiti. The microgrid survey of Acul-du-Nord was undertaken from the 18th to 20th of August, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Acul-du-Nord are fishing, agriculture, livestock, and small businesses. About half of the businesses interviewed in Acul-du-Nord have their own source of generation, whether generators or solar panels. This indicates that there is already some demand for energy in the business sector. Fuel costs 150-220 HTG per gallon for gasoline, 150 HTG per gallon of diesel, and 25-50 HTG per bidon of kerosene. There are approximately 600 buildings that could be potentially connected to a micro-grid in Acul-du-Nord. The current major energy users in the town are the churches, large schools, and the hospital.

Table 31 – Energy Expenditures in Acul-du-Nord

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	9,289
Weekly Household Expenditures	141,958
Total Weekly Expenditures	151,247
Gasoline and Diesel Consumed Weekly	42 gallons

Strength of Community-Based Organizations

There are two community-based organizations in Acul-du-Nord, focusing on development, as well as social and cultural activities. Some activities undertaken by NGOs in Acul-du-Nord include funding and the provision of supplies to farmers.

Accessibility and Potential Setbacks

Acul-du-Nord is easily accessible by all forms of ground transportation on paved roads. Also, Acul-du-Nord is not located next to a body of water, minimizing the risk of flooding.

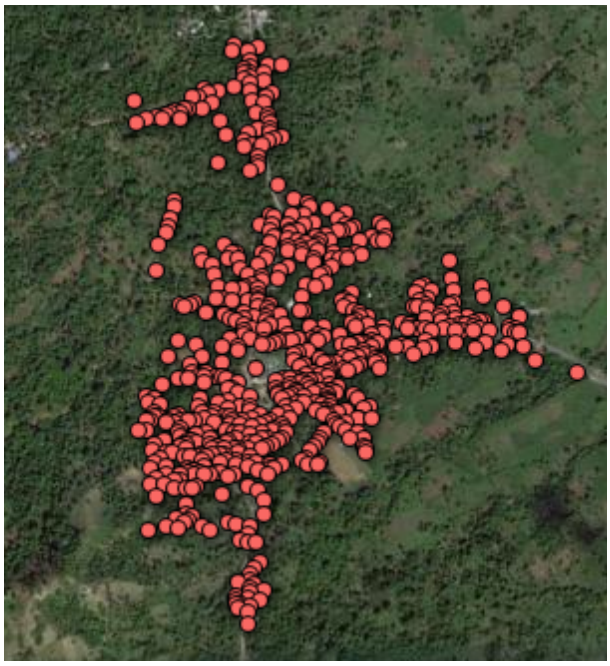

Figure 12 – Potential Connections in Acul-du-Nord (Map Imagery: Google Earth, DigitalGlobe)

Anse-à-Pitre, Rank: 27

Anse-à-Pitre is a town of approximately 27,000 people located in the Sud-Est department of Haiti. The microgrid survey of Anse-à-Pitre was undertaken from the 12th to 15th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Anse-à-Pitre are fishing and selling used clothing and appliances. Almost all of the businesses interviewed in Anse-à-Pitre have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline, 200 HTG per gallon of diesel, and 30-60 HTG per bidon of kerosene. There are approximately 800 buildings that could be potentially connected to a micro-grid in Anse-à-Pitre. The current major energy users in the town are the clinic and a couple of hotels.

Table 32 – Energy Expenditures in Anse-à-Pitre

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	6,635
Weekly Household Expenditures	94,025
Total Weekly Expenditures	100,660
Gasoline and Diesel Consumed Weekly	36 gallons

Anse-à-Pitre has a brownfield microgrid. Some of the businesses and households interviewed are connected to the grid, but it no longer functions. Thus, there is some energy infrastructure already present in Anse-à-Pitre.

Strength of Community-Based Organizations

There are two community-based organizations in Anse-à-Pitre, serving groups of farmers. Some activities undertaken by NGOs in Anse-à-Pitre include maternity support, construction, and the provision of supplies to farmers.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Anse-à-Pitre is theft of solar panels – according to the residents of the town this is already a problem. Also, Anse-à-Pitre is located in a low-lying coastal area, making it susceptible to flooding.

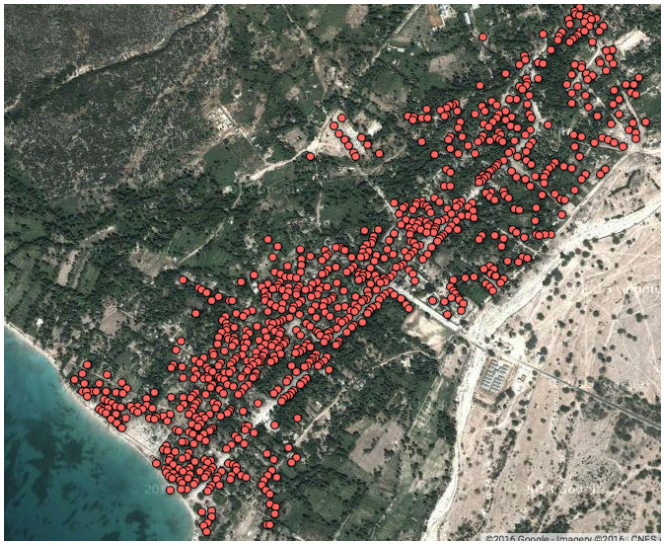

Figure 13 – Potential Connections in Anse-à-Pitre (Map Imagery: Google Earth, DigitalGlobe)

Grande-Rivière-du-Nord, Rank: 29

GrandeRivière-du-Nord is a town of approximately 37,000 people located in the Nord department of Haiti. The microgrid survey of Grande-Rivière-du-Nord was undertaken from the 1st to the 5th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Grande-Rivière-du-Nord is agriculture (oranges, cocoa, plantains, sugar cane, and coffee). The businesses interviewed in Grande-Rivière-du-Nord all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 220 HTG per gallon for gasoline, 290 per gallon of diesel, and 30-50 HTG per bidon of kerosene. There are approximately 1000 buildings that could be potentially connected to a micro-grid in Grande-Rivière-du-Nord. The current major energy user in the town is the drinking water plant.

Table 33 – Energy Expenditures in Grande-Rivière-du-Nord

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	3,000
Weekly Household Expenditures	240,000
Total Weekly Expenditures	243,000
Gasoline and Diesel Consumed Weekly	13 gallons

Grande-Rivière-du-Nord is partially served by a grid run by an EdH hydropower generator that operates 1-3 hours most days.

Strength of Community-Based Organizations

There are three community-based organizations, representing over 600 individuals, in Grande-Rivière-du-Nord. They serve women and children, and monitor lighting issues. There are some NGOs in town, distributing food to schools as well and distributing seedlings to farmers.

Accessibility and Potential Setbacks

Road access for large trucks appears acceptable year-round. Grande-Rivière-du-Nord is located on the bank of a river, making it susceptible to flooding.

Moron, Rank: 29

Moron is a town of approximately 28,000 people located in the Grand-Anse department of Haiti. The microgrid survey of Moron was undertaken from the 19th to 22nd of August, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Moron is agriculture (cocoa, breadfruit, plantains, corn and beans). The businesses interviewed in Moron all have their own source of generation, whether generators or solar panels. There are approximately 700 buildings that could be potentially connected to a micro-grid in Moron. The current major energy users in the town are Digicel, and a health center.

Table 34 – Energy Expenditures in Moron

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	3,600
Weekly Household Expenditures	129,000
Total Weekly Expenditures	133,000
Gasoline and Diesel Consumed Weekly	262 gallons

Moron has a brownfield microgrid, managed by EdH. Some of the businesses and households interviewed are connected to the grid, but it functions only occasionally (up to 2 times per month). Thus, there is some energy infrastructure already present in Moron.

Strength of Community-Based Organizations

Community-based organizations are present, and include one that supports the hospital and another affiliated with the church. NGOs in Moron are mostly involved in health-related activities (including Doctors Without Borders).

Accessibility and Potential Setbacks

Accessibility is a major issue for Moron. The road is not accessible, even for small cars. Additionally, the buildings are relatively spread out, without a dense downtown area. Moron is located on the bank of a river, making it potentially susceptible to flooding.

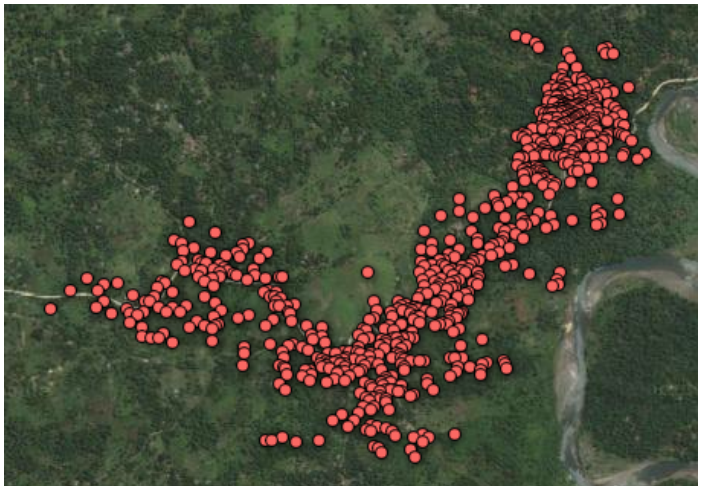

Figure 14 - Potential Connections in Moron (Map Imagery: Google Earth, DigitalGlobe)

Thomassique, Rank: 29

Thomassique is a town of approximately 57,000 people located in the Centre department of Haiti. The microgrid survey of Thomassique was undertaken from the 2nd to 5th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Thomassique are retail and commerce. Many of the residents travel to Santo Domingo to purchase goods for resale. Furthermore, the town has a huge market on Tuesday and Friday drawing in people from surrounding

towns. Almost all the businesses interviewed in Thomassique are already grid-connected, indicating a high demand for energy in the business sector. Fuel costs 150 HTG per gallon of gasoline and 25-30 HTG per bidon of kerosene. There are approximately 900 buildings that could potentially be connected to a micro-grid in Thomassique. The current major energy users in the town are small clubs and some some restaurants.

Table 35 – Energy Expenditures in Thomassique

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	9,359
Weekly Household Expenditures	132,900
Total Weekly Expenditures	142,259
Gasoline and Diesel Consumed Weekly	52 gallons

Thomassique is partially served by the EdH grid. Most of the businesses and households interviewed are connected to the grid, which runs between 1-7 days per week, for 4-6 hours per day. Thus, there is some operational energy infrastructure already present in Thomassique.

Strength of Community-Based Organizations

There are community-based organizations in Thomassique, providing professional training for women, youth classes, organizing cultural and sporting events, and engaging in soil conservation projects. There is one NGO in Thomassique, World Vision, serving families through providing nutrition for pregnant women, building schools, and helping with the education of children.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Thomassique is accessibility to the town through a very mountainous road, potentially making access to the town with large trucks difficult. There is reportedly a project underway to fix the roads.

Arnaud, Rank: 32

Arnaud is a town of approximately 14,000 people located in the Nippes department of Haiti. The microgrid survey of Arnaud was undertaken from the 29th of September to the 3rd of October, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Arnaud are agriculture (sugar cane, peanuts, and corn) and small retailers. About two thirds of the businesses interviewed in Arnaud have their own source of generation, whether generators or solar panels. This indicates that there is already some demand for energy in the business sector. Fuel costs 175-250 HTG per gallon for gasoline, 175-250 HTG per gallon of diesel, and 50-70 HTG per bidon of kerosene. There are approximately 500 buildings that could be potentially connected to a micro-grid in Arnaud. The current largest energy users

in the town are a restaurant with cold storage, a business selling construction materials, the mill, and some nightclubs.

Table 36 – Energy Expenditures in Arnaud

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	4,820
Weekly Household Expenditures	187,766
Total Weekly Expenditures	192,586
Gasoline and Diesel Consumed Weekly	54 gallons

Strength of Community-Based Organizations

There is a community-based organization in Arnaud, providing training for its members. Some activities undertaken by NGOs in Arnaud include water treatment, and agroforestry.

Accessibility and Potential Setbacks

Arnaud is accessible year-round by ground transportation, including large trucks. One of the potential setbacks for the development of a micro-grid in Arnaud is that there are no major energy users at this time. However, there are some large hotels under construction that have the potential to be major energy-users. Also, Arnaud is located near some rivers, making it potentially susceptible to flooding.

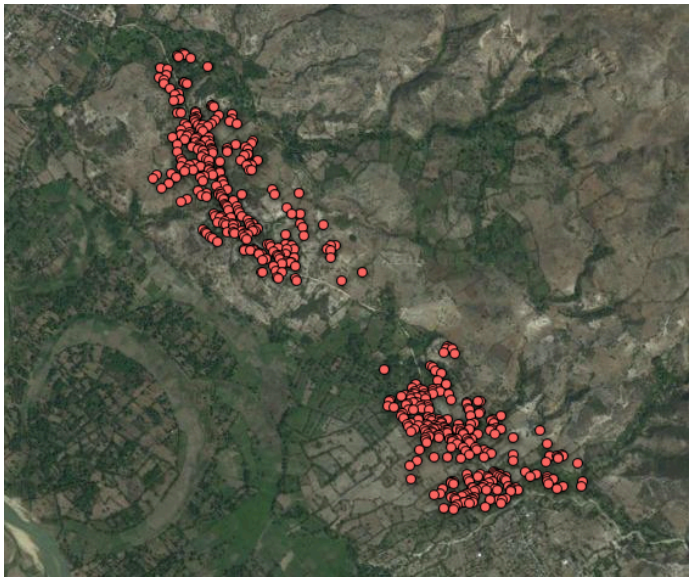

Figure 15 – Potential Connections in Arnaud (Map Imagery: Google Earth, DigitalGlobe)

Cerca-La-Source, Rank: 32

Cerca-La-Source is a town of approximately 51,000 people located in the Centre department of Haiti. The microgrid survey of Cerca-La-Source was undertaken from the 1st to 5th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Cerca-La-Source is agriculture (rice, beans, peanuts, and corn). Most of the businesses interviewed in Cerca-La-Source have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline, 155 HTG per gallon of diesel, and 30-60 HTG per bidon of kerosene. There are approximately 900 buildings that could be potentially connected to a micro-grid in Cerca-La-Source. The current major energy users in the town are the clinic, the churches, welders, and the phone recharging businesses.

Table 37 – Energy Expenditures in Cerca-La-Source

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	10,895
Weekly Household Expenditures	119,399
Total Weekly Expenditures	130,294
Gasoline and Diesel Consumed Weekly	30 gallons

Strength of Community-Based Organizations

There are community-based organizations in Cerca-La-Source, focusing on the economic development of women, education, and health. NGOs in Cerca-La-Source focus on health and economic development.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Cerca-La-Source is accessibility – the road leading to town is broken up by a river in both directions. Also, Cerca-La-Source is built on the bank of the river, making it susceptible to flooding.

Ferrier, Rank: 32

Ferrier is a town of approximately 13,000 people located in the Nord-Est department of Haiti. The microgrid survey of Ferrier was undertaken from the 22nd to 24th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Ferrier are agriculture (rice, corn, and beans) and livestock. None of the businesses interviewed in Ferrier have their own source of generation, whether generators or solar panels. This indicates that there is not much demand for energy in the business sector, above and beyond what is provided by the grid. Fuel costs 50-75 HTG per bidon of kerosene. There are approximately 650 buildings that could be potentially connected to a micro-grid in Ferrier. The current major energy user in the town is the church.

Table 38 – Energy Expenditures in Ferrier

Expenditure Type	Amount (HTG)

Weekly Business Expenditures	520
Weekly Household Expenditures	128,100
Total Weekly Expenditures	132,280
Gasoline and Diesel Consumed Weekly	0 gallons

Ferrier is partially served by an EdH grid. Some of the businesses and households interviewed are connected to the grid, which runs for 6 hours per day, 7 days a week. Thus, there is some operational energy infrastructure already present in Ferrier.

Strength of Community-Based Organizations

There is a community-based organization in Ferrier, which is a farming association. The NGO presence in Ferrier focuses on training for farmers.

Accessibility and Potential Setbacks

Ferrier is easily accessible by ground transportation. One of the potential setbacks for the development of a micro-grid in Ferrier is the existence of a working grid.

Ganthier, Rank: 32

Ganthier is a town of approximately 67,000 people located in the Ouest department of Haiti. The microgrid survey of Ganthier was undertaken from the 8th to 12th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Ganthier are agriculture (corn, beans, yams, and sugar cane) and fishing. The businesses interviewed in Ganthier all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200 HTG per gallon for gasoline, 200 HTG per gallon for diesel, and 25-50 HTG per bidon of kerosene. There are approximately 400 buildings that could be potentially connected to a micro-grid in Ganthier. The major energy user in town is the morgue.

Table 39 – Energy Expenditures in Ganthier

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	1,600
Weekly Household Expenditures	58,000
Total Weekly Expenditures	59,000
Gasoline and Diesel Consumed Weekly	11 gallons

Ganthier has a grid operated by EdH that runs 3-4 days per week for 2-3 hours per day. Thus, there is some operational energy infrastructure already present in Ganthier.

Strength of Community-Based Organizations

There are at least four community-based organizations in Ganthier with a combined membership in excess of 1000. In general, the organizations focus on the development of the town, in areas of agriculture, health, infrastructure and education. NGOs in town focus on road construction, soil conservation, and managing disaster risk.

Accessibility and Potential Setbacks

The road is accessible year-round, as it is adjacent to a major road on the Haiti – Dominican Republic border. The political interviews yielded a discussion about potential conflict with EdH by constructing a microgrid in Ganthier, despite the enthusiasm for such a project.

Pont-Sondé, Rank: 32

Pont-Sondé is a town of approximately 10,000 people located in the Artibonite department of Haiti. The microgrid survey of Pont-Sondé was undertaken from the 8th to 12th of September, 2015.

Energy Expenditures and Business Development Potential

The main economic drivers of Pont-Sondé are agriculture (rice, tomatoes, and corn), retailers, hotel, building material resale, food companies, and an ice plant. Almost all of the businesses interviewed have generation, whether by grid connection or generator. This indicates a high demand for energy in the business sector. Fuel costs 200-245 HTG per gallon of gasoline, 200 HTG per gallon of diesel, and 20-200 HTG per bidon of kerosene. There are approximately 1000 buildings that could potentially be connected to a micro-grid in Pont-Sondé. The current major energy users in the town are some of the businesses, including a welding shop and factory, some institutions including the churches, and some wealthy households.

Table 40 – Energy Expenditures in Pont-Sondé

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	17,749
Weekly Household Expenditures	131,251
Total Weekly Expenditures	149,000
Gasoline and Diesel Consumed Weekly	70 gallons

Pont-Sondé is partially served by the EdH grid. A majority of the businesses and about half of the households interviewed are connected to the grid, which functions 1-12 hours a day, 1-7 days a week. Thus, there is energy infrastructure already present in Pont-Sondé.

Strength of Community-Based Organizations

There are two community-based organizations interviewed in Pont-Sondé, which partake in collecting garbage, operating a professional training school, organizing

politically, and working on road infrastructure. Some NGO activities in Pont-Sondé include potable water and agriculture aid.

Accessibility and Potential Setbacks

Pont-Sondé is accessible throughout the year by national routes, although they are unpaved. One of the potential setbacks for the development of a micro-grid in Pont-Sondé is the lack of training of the population, and a perceived lack of will of the population. Additionally, Pont-Sondé is located near the bank of a river, making it vulnerable to flooding.

Sainte Suzanne, Rank: 32

Sainte Suzanne is a town of approximately 25,000 people located in the Nord-Est department of Haiti. The microgrid survey of Sainte Suzanne was undertaken from the 8th to 12th of September, 2015.

Energy Expenditures and Business Development Potential

The main economic drivers of Sainte Suzanne are retail, street vending, a cane mill, and a bakery. Both of the businesses interviewed are grid connected, possibly indicating a demand for energy in the business sector. Fuel costs 200 HTG per gallon of gasoline and 25-50 HTG per bidon of kerosene. There are approximately 1000 buildings that could potentially be connected to a micro-grid in Sainte Suzanne. The current major energy users in the town are shops selling carbonated beverages.

Table 41 – Energy Expenditures in Sainte Suzanne

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	770
Weekly Household Expenditures	72,449
Total Weekly Expenditures	73,219
Gasoline and Diesel Consumed Weekly	3 gallons

Sainte Suzanne has a brownfield microgrid, operated by NRECA. Many of the businesses and households interviewed are connected to the grid, which functions 24 hours a day, 7 days a week. Thus, there is reliable energy infrastructure already present in Sainte Suzanne.

Strength of Community-Based Organizations

There is one community-based organization in Sainte Suzanne, which organizes street cleanings and contests for entertainment. NGO activity in Sainte Suzanne includes health, animal husbandry, youth training, distribution of seedlings, and soil conservation.

Accessibility and Potential Setbacks

Although access to Sainte Suzanne is hilly, it is accessible year-round on paved roads. One potential setback to microgrid development is the presence of a functioning NRECA microgrid.

Anse-à-Veau, Rank: 38

Anse-à-Veau is a town of approximately 55,000 people located in the Nippes department of Haiti. The microgrid survey of Anse-à-Veau was undertaken from the 12th to 14th of July, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Anse-à-Veau is fishing. Almost all of the businesses interviewed in Anse-à-Veau have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200-250 HTG per gallon for gasoline, 38 HTG per gallon of diesel, and 25-30 HTG per bidon of kerosene. There are approximately 400 buildings that could be potentially connected to a micro-grid in Anse-à-Veau. The current major energy users in the town are the large businesses (bar and hotel) and the fishermen.

Table 42 – Energy Expenditures in Anse-à-Veau

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	6,925
Weekly Household Expenditures	137,161
Total Weekly Expenditures	144,086
Gasoline and Diesel Consumed Weekly	60 gallons

Anse-à-Veau has a brownfield microgrid, managed by EdH. Some of the businesses and households interviewed are connected to the grid, but only runs during important holidays. Thus, there is some energy infrastructure already present in Anse-à-Veau.

Strength of Community-Based Organizations

There are community-based organizations in Anse-à-Veau, providing the following services: community radio, windmill, sanitation, and support to fishermen. Some activities undertaken by NGOs in Anse-à-Veau include health and agricultural activities undertaken by FAO.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Anse-à-Veau is that some of the buildings are located very far away from each other, and that a river divides some parts of the town. Also, this proximity to the river increases the risk of potential flooding. Anse-à-Veau is easily accessible by ground transport.

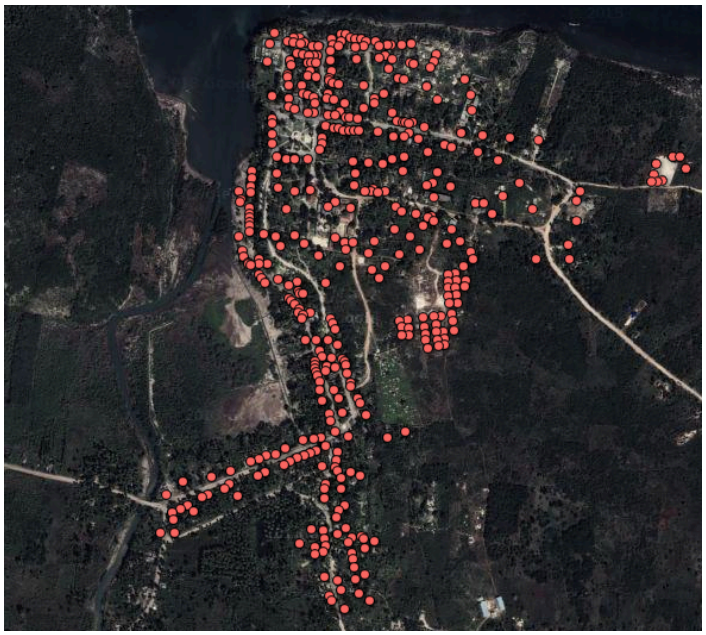

Figure 16 – Potential Connections in Anse-à-Veau (Map Imagery: Google Earth, DigitalGlobe)

Bord de mer de Limonade, Rank: 38

Bord de mer de Limonade is a town of approximately 15,000 people located in the Nord department of Haiti. The microgrid survey of Bord de mer de Limonade was undertaken from the 29th of September to the 3rd of October, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Bord de mer de Limonade are fishing and agriculture (plantains, beans, and cassava). Some of the businesses interviewed in Bord de mer de Limonade have their own source of generation, whether generators or solar panels. This indicates that there is already some demand for energy in the business sector. Fuel costs 200-1000 HTG per gallon for gasoline and 25-40 HTG per bidon of kerosene. There are approximately 500 buildings that could be potentially connected to a micro-grid in Bord de mer de Limonade. The current major energy user in the town is a water filtration factory called Amanzi.

Table 43 – Energy Expenditures in Bord de mer de Limonade

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	5,000
Weekly Household Expenditures	153,518
Total Weekly Expenditures	158,518
Gasoline and Diesel Consumed Weekly	42 gallons

Bord de mer de Limonade is partially connected to the EdH grid. Some of the businesses and households interviewed are connected to the grid, but not receiving

any electricity. Thus, there is some energy infrastructure already present in Bord de mer de Limonade.

Strength of Community-Based Organizations

There are two community-based organizations in Bord de mer de Limonade, protecting coral reefs and plant life. USAID finances a project in Bord de mer de Limonade to protect and manage mangrove forests, in an effort to preserve fish populations. Other NGOs focus on agriculture and potable water.

Accessibility and Potential Setbacks

Bord de mer de Limonade is easily accessible. One of the potential setbacks for the development of a micro-grid in is that there is talk of another energy project coming to the town, run by Caracol. Also, Bord de mer de Limonade is located in a low-lying coastal area, making it susceptible to flooding.

La Tortue, Rank: 38

La Tortue is a town of approximately 35,000 people located in the Nord-Ouest department of Haiti. The microgrid survey of La Tortue was undertaken from the 15th to 19th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of La Tortue are agriculture (cassava, potatoes, peanuts, bananas, and sugar cane) and fishing. The businesses interviewed in La Tortue all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline, and 50 HTG per bidon of kerosene. There are approximately 120 buildings that could be potentially connected to a micro-grid in La Tortue. The current major energy users in the town are the hospital and the morgue.

Table 44 – Energy Expenditures in La Tortue

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	24,000
Weekly Household Expenditures	12,000
Total Weekly Expenditures	36,000
Gasoline and Diesel Consumed Weekly	115 gal

Strength of Community-Based Organizations

There are four community-based organizations, representing over 500 individuals, and addressing issues such as cultural events and women's working groups. NGO activities in the town are focused on potable water and education.

Accessibility and Potential Setbacks

Access to the town is currently limited to boats, since it is on an island. There is a road as well, but it is in poor condition. Lack of road access for large trucks would likely present a formidable setback for a microgrid development project.

Luly, Rank: 38

Luly is a town of approximately 2,000 people located in the Ouest department of Haiti. The microgrid survey of Luly was undertaken from the 20th to 22nd of August, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Luly is fishing. A reported 90% of the population dedicates itself to this industry. To a lesser degree, agriculture is practiced, cultivating such crops as beans and plantains. The businesses interviewed in Luly all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200 HTG per gallon for gasoline, 175 HTG per gallon of diesel, and 25-30 HTG per bidon of kerosene. There are approximately 400 buildings that could be potentially connected to a micro-grid in Luly. The current major energy users in the town are fishermen who refrigerate their seafood, the disco, and the gas station.

Table 45 – Energy Expenditures in Luly

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	5,600
Weekly Household Expenditures	354,000
Total Weekly Expenditures	360,000
Gasoline and Diesel Consumed Weekly	132 gal

There is a brownfield microgrid in Luly, run by a diesel generator. However, none of the businesses or households was connected to the grid, which does not appear to be functioning. However, this indicates that there is some energy infrastructure present in Luly.

Strength of Community-Based Organizations

Community-based organizations in Luly serve socio-cultural matters and the fishing industry.

Accessibility and Potential Setbacks

There is a healthy density of residences and businesses in the town center, and land is apparently available for grid infrastructure development. In terms of accessibility, the road is in good shape and accessible for even large trucks year-round. Luly is located in a low-lying coastal area, which make it susceptible to flooding.

Remaining Towns

Anse-à-Foleur, Rank: 42

Anse-à-Foleur is a town of approximately 17,000 people located in the Nord-Ouest department of Haiti. The microgrid survey of Anse-à-Foleur was undertaken from the 14th to 19th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Anse-à-Foleur are the hotels (housing people who come from all over Haiti to see a statue of St. Anne) and agriculture (bananas, yams, and breadfruit). Most of the businesses interviewed in Anse-à-Foleur have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 230-250 HTG per gallon for gasoline, 225 HTG per gallon of diesel, and 30-50 HTG per bidon of kerosene. There are approximately 600 buildings that could be potentially connected to a micro-grid in Anse-à-Foleur. The current major energy users in the town are the church, hotels, and some large homeowners.

Table 46 – Energy Expenditures in Anse-à-Foleur

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	5,920
Weekly Household Expenditures	223,048
Total Weekly Expenditures	228,968
Gasoline and Diesel Consumed Weekly	50 gallons

Anse-à-Foleur has a brownfield microgrid. Some of the businesses and households interviewed are connected to the grid, but it no longer functions. Thus, there is some energy infrastructure already present in Anse-à-Foleur.

Strength of Community-Based Organizations

There are community-based organizations in Anse-à-Foleur, serving groups of women and support for cultural and social activities. Some activities undertaken by NGOs in Anse-à-Foleur include: water and sanitation (construction of toilets), education, road maintenance, and health.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Anse-à-Foleur is the quality of the roads. It is difficult to access the town, which is located in between a river and the sea. Maritime transport is not possible because there is no port. Also, Anse-à-Foleur is located in a low-lying coastal area, making it susceptible to flooding.

Figure 17 – Potential Connections in Anse-à-Foleur (Map Imagery: Google Earth, DigitalGlobe)

Arniquet, Rank: 42

Arniquet is a town of approximately 27,000 people located in the Sud department of Haiti. The microgrid survey of Arniquet was undertaken from the 11th to 14th of August, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Arniquet are commerce (importing items to the town for resale), raising livestock, and agriculture (plantains, beans, and breadfruit). Most of the businesses interviewed in Arniquet have a grid connection or their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 1000 HTG per gallon for gasoline, 500 HTG per gallon of diesel, and 40-50 HTG per bidon of kerosene. There are approximately 200 buildings that could be potentially connected to a micro-grid in Arniquet. The current major energy users in the town are Digicel, a corn mill, cold drink vendors, and a bakery.

Table 47 – Energy Expenditures in Arniquet

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	16,548
Weekly Household Expenditures	159,661
Total Weekly Expenditures	176,209
Gasoline and Diesel Consumed Weekly	44 gallons

Arniquet is partially served by an EdH grid. Some of the businesses and households interviewed are connected to the grid, which runs 3 days a week for 3-6 hours per day. Thus, there is some operational energy infrastructure already present in Arniquet.

Strength of Community-Based Organizations

There is a community-based organization in Arniquet providing assistance and information to businesses. There is an NGO in Arniquet that provides support for youth.

Accessibility and Potential Setbacks

Arniquet is easily accessible throughout the year. One of the potential setbacks for the development of a micro-grid in noted by the researchers is the potential inability of the residents to afford paying for electricity, and the existence of a working grid already in the town. Also, Arniquet is located in close proximity to multiple rivers, including one running through the commune – therefore, there is potential for flooding.

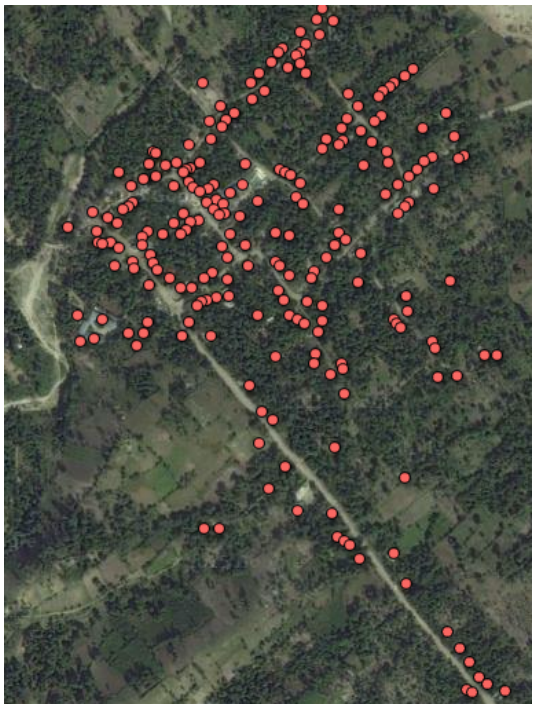

Figure 18 – Potential Connections in Arniquet (Map Imagery: Google Earth, DigitalGlobe)

Boucan-Carré, Rank: 42

Boucan-Carré is a town of approximately 51,000 people located in the Centre department of Haiti. The microgrid survey of Boucan-Carré was undertaken from the 8th to 12th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Boucan-Carré are agriculture (beans, potatoes, plantains) and small businesses. Most of the businesses interviewed in Boucan-Carré have a grid connection and/or their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 250-400 HTG per gallon for gasoline, 150-250 HTG per gallon of diesel, and 30-75 HTG per bidon of kerosene. There are approximately 500 buildings that could be potentially connected to a micro-grid in Boucan-Carré. The current major energy users in the town are some of the businesses (particularly those with an EDH electricity connection, and the welders.

Table 48 – Energy Expenditures in Boucan-Carré

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	18,555
Weekly Household Expenditures	144,459
Total Weekly Expenditures	163,014
Gasoline and Diesel Consumed Weekly	25 gallons

Boucan-Carré is partially served by EdH. Most of the businesses and households interviewed are connected to the grid, which runs 12 hours a day, 4-7 days per week. Thus, there is some operational energy infrastructure already present in Boucan-Carré.

Strength of Community-Based Organizations

There are a number of community-based organizations in Boucan-Carré, serving women, youth, and farmers. NGOs in Boucan-Carré focus on food, agriculture, education, and health.

Accessibility and Potential Setbacks

Boucan-Carré is accessible by truck, but not easily because the roads are in poor condition. Also, the road to town is not accessible year round. One of the potential setbacks for the development of a micro-grid in Boucan-Carré is the EDH presence. Also, Boucan-Carré is located on the bank of a river, making it susceptible to flooding.

Paillant, Rank: 42

Paillant is a town of approximately 15,000 people located in the Nippes department of Haiti. The microgrid survey of Paillant was undertaken from the 12-14th of August, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Paillant is agriculture (cabbage, carrot, beans, and yam). The businesses interviewed in Paillant all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline. There are approximately 350 buildings that could be potentially connected to a micro-grid in Paillant. The current major energy users in the town are a funeral business and restaurants.

Table 49 – Energy Expenditures in Paillant

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	9,000
Weekly Household Expenditures	86,000
Total Weekly Expenditures	95,000
Gasoline and Diesel Consumed Weekly	51 gal

Paillant has a grid run by EdH, which operates an average of 2 days per week, for an average of 3 hours per day.

Strength of Community-Based Organizations

Three community-based organizations were identified in Paillant, mostly addressing socio-economic issues and sanitation.

Accessibility and Potential Setbacks

Road access is good and no potential setbacks to development of a micro-grid were identified.

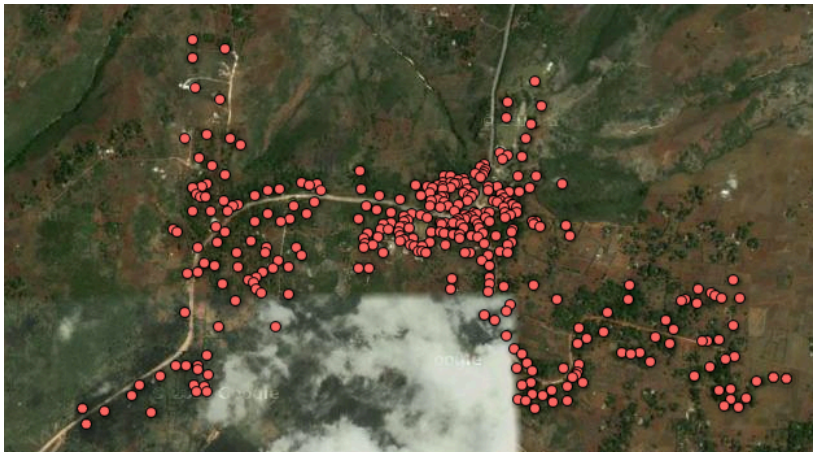

Figure 19 - Potential Connections in Paillant (Map Imagery: Google Earth, DigitalGlobe)

Plaisance, Rank: 42

Plaisance is a town of approximately 63,000 people located in the Nord department of Haiti. The microgrid survey of Plaisance was undertaken from the 22nd to 26th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Plaisance is agriculture (sugar cane, cocoa, and yams). Many other businesses also exist in Plaisance such as soft drink vending, bakery, dry cleaning, hardware store, and ironworking. A vital market is also found serving la Pointe Nord and l'Artibonite.

Over half of the businesses interviewed in Plaisance have their own source of generation, whether generators, solar panels, or grid connection, indicating some demand for energy in the business sector. Fuel costs 190-250 HTG per gallon of gasoline, 200-250 HTG per gallon of diesel, and 25-50 HTG per bidon of kerosene. There are approximately 400 buildings that could potentially be connected to a micro-grid in Plaisance. The current major energy users in the town are the churches, hardware store, dry-cleaners, bakery, and a few households.

Table 50 – Energy Expenditures in Plaisance

Expenditure Type	Amount (HTG)

Weekly Business Expenditures	18,820
Weekly Household Expenditures	116,100
Total Weekly Expenditures	134,920
Gasoline and Diesel Consumed Weekly	97 gallons

Plaisance has a brownfield microgrid, with a diesel generator. Some of the businesses and households interviewed are connected to the grid, which runs for 2-4 hours per day, 1-2 days per week. Thus, there is some operational energy infrastructure already present in Plaisance.

Strength of Community-Based Organizations

The presence of NGOs in Plaisance is weak, but some are reportedly active and work in sectors including education, roads, coppicing, and sanitation.

Accessibility and Potential Setbacks

The road infrastructure to Plaisance is in fairly good condition and able to support traffic of large trucks year-round. However, one portion of the road nearing Plaisance (Pilboro) is in very poor condition, which could present difficulties in accessing the town with large trucks. Additionally, potential difficulties could arise in trying to collaborate with the current grid provider.

Thiotte, Rank: 42

Thiotte is a town of approximately 32,000 people located in the Sud-Est department of Haiti. The microgrid survey of Thiotte was undertaken from the 9th to 11th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Thiotte is agriculture. The businesses interviewed in Thiotte all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 175-200 HTG per gallon for gasoline. There are approximately 450 buildings that could be potentially connected to a micro-grid in Thiotte.

Table 51 – Energy Expenditures in Thiotte

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	7,000
Weekly Household Expenditures	159,000
Total Weekly Expenditures	166,000
Gasoline and Diesel Consumed Weekly	49 gallons

Strength of Community-Based Organizations

One organization was identified in town, with 400 members. Its areas of focus include agriculture and environment.

Accessibility and Potential Setbacks

Information regarding accessibility or potential setbacks was not available.

Tiburon, Rank: 42

Tiburon is a town of approximately 21,000 people located in the Sud department of Haiti. The microgrid survey of Tiburon was undertaken from the 11th to 15th of August, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Tiburon are agriculture (plantains, peanuts and black beans) and fishing. The businesses interviewed in Tiburon all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline, 200 HTG per gallon of diesel, and 45-60 HTC per bidon of kerosene. There are approximately 400 buildings that could be potentially connected to a micro-grid in Tiburon. The current major energy users in the town are the fish facility, hotels and nightclubs.

Table 52 – Energy Expenditures in Tiburon

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	8,045
Weekly Household Expenditures	153,566
Total Weekly Expenditures	161,611
Gasoline and Diesel Consumed Weekly	61

Tiburon has a brownfield microgrid. Some of the businesses and households interviewed are connected to the grid, but it no longer functions. Thus, there is some energy infrastructure already present in Tiburon.

Strength of Community-Based Organizations

Two community-based organizations in town address agricultural issues.

Accessibility and Potential Setbacks

Roads leading to the town are accessible, but not paved. In town, the roads are paved. Large trucks and buses were observed traveling to and within the town without apparent difficulty. No major potential setbacks identified.

Figure 20 - Potential Connections in Tiburon (Map Imagery: Google Earth, DigitalGlobe)

Bonbon, Rank: 49

Bonbon is a town of approximately 8,000 people located in the Grand-Anse department of Haiti. The microgrid survey of Bonbon was undertaken from the 19th to 24th of August, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Bonbon is fishing. Almost all of the businesses interviewed in Bonbon have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 230-250 HTG per gallon for gasoline, 180-225 HTG per gallon of diesel, and 15-25 HTG per bidon of kerosene. There are approximately 200 buildings that could be potentially connected to a micro-grid in Bonbon. The current major energy users in the town are the church and the public institutions. At one time the fishermen had access to cold storage, but not anymore.

Table 53 – Energy Expenditures in Bonbon

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	11,075
Weekly Household Expenditures	52,470
Total Weekly Expenditures	63,545
Gasoline and Diesel Consumed Weekly	69 gallons

Bonbon has a brownfield microgrid, run by a steam turbine. A few of the households interviewed are connected to the grid, but it no longer functions. Thus, there is some energy infrastructure already present in Bonbon.

Strength of Community-Based Organizations

There are two community-based organizations in Bonbon, serving groups of women and fishermen. NGOs active in Bonbon provide materials to fishermen, are active in the health space, construct houses, and distribute food aid.

Accessibility and Potential Setbacks

Bonbon is easily accessible by large trucks. One of the potential setbacks for the development of a micro-grid in Bonbon the lack of a thriving business community, the fact that schooled technicians and welders have left the town to find work elsewhere. Also, Bonbon is located in a low-lying coastal area, making it susceptible to flooding.

Figure 21 – Potential Connections in Bonbon (Map Imagery: Google Earth, DigitalGlobe)

Dondon, Rank: 49

Dondon is a town of approximately 31,000 people located in the Nord department of Haiti. The microgrid survey of Dondon was undertaken from the 7th to 12th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Dondon is small business, including food shops, bakeries, and construction material stores. Some of the businesses interviewed in Dondon have their own source of generation, whether generators or solar panels. This indicates that there is already some demand for energy in the business sector. Fuel costs 200 HTG per gallon for gasoline, 157 HTG per gallon of diesel, and 25-50 HTG per bidon of kerosene. There are approximately 350 buildings that could be potentially connected to a micro-grid in Dondon. There are not many large energy users – but one school was noted as having it own solar generation.

Table 54 – Energy Expenditures in Dondon

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	885
Weekly Household Expenditures	51,686
Total Weekly Expenditures	52,571

Gasoline and Diesel Consumed Weekly	13 gallons

Strength of Community-Based Organizations

There is a community-based organization in Dondon, which provides training with the goal of economic advancement. Some activities undertaken by NGOs in Dondon are sanitation and technology transfer to farmers.

Accessibility and Potential Setbacks

The road to Dondon is not in very good condition, but is accessible by trucks. One of the potential setbacks for the development of a micro-grid in Dondon is that it is included under PAST – a World Bank / UNESCO initiative to finance connections in this historic part of the north of the country. Also, Dondon is located on the bank of a river, making it susceptible to flooding.

Duchity, Rank: 49

Duchity is a town located in the Sud department of Haiti. The microgrid survey of Duchity was undertaken from the 12th to 14th of August, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Duchity are agriculture (yams and beans), raising livestock, and the market. Most of the businesses interviewed in Duchity have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline, 200 HTG per gallon of diesel, and 50-100 HTG per bidon of kerosene. There are approximately 350 buildings that could be potentially connected to a micro-grid in Duchity. The current major energy users in the town are the Catholic church, a printing shop, and a shop that sells IT.

Table 55 – Energy Expenditures in Duchity

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	4,290
Weekly Household Expenditures	127,060
Total Weekly Expenditures	131,350
Gasoline and Diesel Consumed Weekly	43 gallons

Strength of Community-Based Organizations

There is a community-based organization in Duchity, serving groups of farmers. The NGO presenc in Duchity focuses on water and sanitation.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Duchity is that it is currently difficult to access the town with large trucks, due to the state of the roads. However, there is road construction under way and it is anticipated that large trucks will be able to pass upon completion of works. Also, Duchity is located near a river, making it susceptible to flooding.

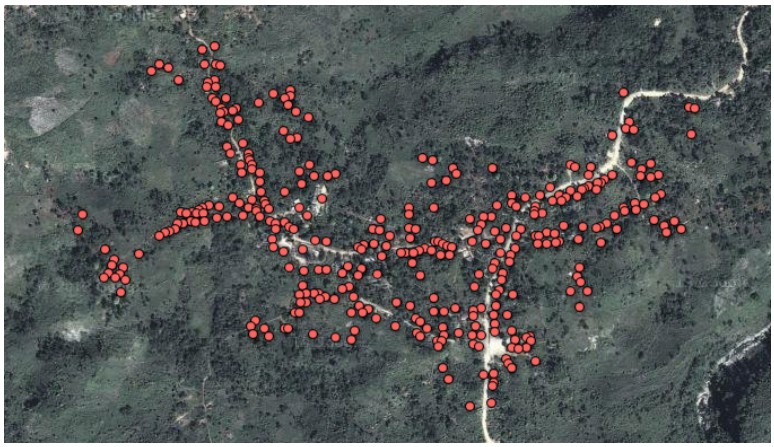

Figure 22 – Potential Connections in Duchity (Map Imagery: Google Earth, DigitalGlobe)

Pilate, Rank: 49

Pilate is a town of approximately 49,000 people located in the Nord department of Haiti. The microgrid survey of Pilate was undertaken from the 19th to 22nd of August, 2015.

Energy Expenditures and Business Development Potential

Several economic activities have been identified in Pilate, including motorcycle and taxi services, agriculture, bar/restaurant, bakery, and commerce. Most of the businesses interviewed in Pilate have their own source of generation, whether generators or solar panels, indicating a high demand for energy in the business sector. Fuel costs 160-250 HTG per gallon of gasoline, 190 HTG per gallon of diesel, and 25-60 HTG per bidon of kerosene. There are approximately 300 buildings that could potentially be connected to a micro-grid in Pilate. The current major energy users in the town are a gas station, bar and restaurants, the bakery, hospitals, Presbyterian church, and multi-service stations.

Table 56 – Energy Expenditures in Pilate

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	7,915
Weekly Household Expenditures	84,538
Total Weekly Expenditures	92,453
Gasoline and Diesel Consumed Weekly	52 gallons

Strength of Community-Based Organizations

There are a number of community-based organizations in Pilate, serving groups of youth and farmers. Some activities undertaken by NGOs in Pilate include road reconstruction, health, education, agriculture, and running a cooperative.

Accessibility and Potential Setbacks

The roads inside Pilate are paved, while the road into Pilate from Plaisance du Nord is somewhat difficult but easily accessible by large trucks year round. The proximity of Pilate to a river makes it potentially susceptible to flooding.

Port Margot, Rank: 49

Port Margot is a town of approximately 45,000 people located in the Nord department of Haiti. The microgrid survey of Port Margot was undertaken from the 19th to 24th of August, 2015, and again on the 24th to 26th of October, 2015.

Energy Expenditures and Business Development Potential

The main economic driver is agriculture. The single business interviewed has solar panels for recharging mobile phones, and a few other businesses (a hotel, a club, and a bakery) in the area may indicate a demand for energy. Fuel costs 135-160 HTG per gallon of diesel, 25-60 HTG per bidon of kerosene. There are approximately 800 buildings that could potentially be connected to a micro-grid in Port Margot. The current major energy users in the town may be the hotel, bakery, club, and restaurant.

Table 57 – Energy Expenditures in Port Margot

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	2,094
Weekly Household Expenditures	54,613
Total Weekly Expenditures	56,707
Gasoline and Diesel Consumed Weekly	15 gallons

Strength of Community-Based Organizations

There are no NGOs present in Port Margot, however, some community organizations exist which work in the sectors of women empowerment, environmental protection, and infrastructure.

Accessibility

Within the town, accessibility is good by all modes of transportation. A potential setback for the development of a micro-grid in Port Margot is that all the land is private. Port-Margot is located on the bank of a river, making it susceptible to flooding.

Borgne, Rank: 54

Borgne is a town of approximately 61,000 people located in the Sud-Est department of Haiti. The microgrid survey of Borgne was undertaken from the 17th to 21st of August, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Borgne are the hotel, restaurant, groceries, and informal phone charging services. Some of the businesses interviewed in Borgne have their own source of generation, whether generators or solar panels. This indicates that there is already demand for energy in the business sector. Fuel costs 200-240 HTG per gallon of diesel and 25 HTG per bidon of kerosene. There are approximately 550 buildings that could be potentially connected to a micro-grid in Borgne. The current major energy users in the town are the hospital, the hotel, a couple of businesses, and the school.

Table 58 – Energy Expenditures in Borgne

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	2,750
Weekly Household Expenditures	89,285
Total Weekly Expenditures	92,035
Gasoline and Diesel Consumed Weekly	12 gallons

Borgne has a brownfield microgrid. Some of the households interviewed are connected to the grid, which runs occasionally. There appears to be some difficulty in negotiations with EdH. Thus, there is some energy infrastructure already present in Borgne.

Strength of Community-Based Organizations

The NGO presence in Borgne focuses on agricultural production.

Accessibility and Potential Setbacks

Borgne is easily accessible by truck. One of the potential setbacks for the development of a micro-grid in Borgne is the uncertainty around the EdH presence in the town. Also, Borgne is situated on the bank of a river, making it susceptible to flooding.

Capotille, Rank: 54

Capotille is a town of approximately 18,000 people located in the Nord-Est department of Haiti. The microgrid survey of Capotille was undertaken from the 14th to 19th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Capotille are a small hotel, a bakery, a disco, and a couple of groceries. All of the businesses interviewed in Capotille have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 220 HTG per gallon for gasoline, 157 HTG per gallon of diesel, and 25 HTG per bidon of kerosene. There are approximately 200 buildings that could be potentially connected to a micro-grid in Capotille. The current major energy users in the town are the hotel and the disco.

Table 59 – Energy Expenditures in Capotille

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	4,206
Weekly Household Expenditures	25,489
Total Weekly Expenditures	29,695
Gasoline and Diesel Consumed Weekly	30 gallons

Strength of Community-Based Organizations

There is a community-based organization in Capotille, serving women. There is an NGO Capotille working on soil conservation and reforestation.

Accessibility and Potential Setbacks

Capotille is easily accessible through any type of ground transportation, year-round. The microgrid survey did not determine any potential setbacks for the development of a microgrid.

Cazale, Rank: 54

Cazale is a town of approximately 44,000 people located in the Ouest department of Haiti. The microgrid survey of Cazale was undertaken from the 19th to 22nd of August, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Cazale is agriculture (beans, watermelon, millet). All of the businesses interviewed in Cazale have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200-300 HTG per gallon for gasoline, 100-200 HTG per gallon of diesel, and 30-200 HTG per bidon of kerosene. There are approximately 500 buildings that could be potentially connected to a micro-grid in Cazale. The current major energy users in the town are the schools, the churches, the hotel, and the disco.

Table 60 – Energy Expenditures in Cazale

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	2,970
Weekly Household Expenditures	115,866
Total Weekly Expenditures	118,836
Gasoline and Diesel Consumed Weekly	25 gallons

Strength of Community-Based Organizations

There is a community-based organization in Cazale, focusing on social and cultural events. There is no known NGO presence in Cazale.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Cazale is the fact that there was already a grid installed, which no longer runs. The people in Cazale appeared distrustful of the potential of another grid being installed. Also, Cazale is located on the bank of a river, making it susceptible to flooding.

Labadie, Rank: 54

Labadie is a town of approximately 25,000 people located in the Nord department of Haiti. The microgrid survey of Labadie was undertaken from the September 21-26, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Labadie are fishing and tourism. Labadie is the main port for cruise ships. Residents use this opportunity to sell crafts and use their small boats as transportation around the island for tourists. The businesses interviewed in Labadie all have their own generators. This indicates that there is already a high demand for energy in the business sector. Fuel costs 225 HTG per gallon for diesel. There are approximately 100 buildings that could be potentially connected to a micro-grid in Labadie. The major energy consumers are the hotels, Morenant Hotel and Belly Beach.

Table 61 – Energy Expenditures in Labadie

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	32,000
Weekly Household Expenditures	35,000
Total Weekly Expenditures	67,000
Gasoline and Diesel Consumed Weekly	31 gallons

Labadie is partially served by an EdH grid that runs about 4 days per week, for an average of 3 hours each day. Some of the businesses and households interviewed are connected to the grid, and of the five businesses connected to the grid, only one is using it.

Strength of Community-Based Organizations

There are a few community-based organizations in Labadie, serving youth groups and one that is run by diaspora members focused on building infrastructure. The diaspora's current project is a bridge.

Accessibility and Potential Setbacks

Labadie is only accessible via boat, and then only possible when the seas are calm. Roads do not exist within the town. Also it is in a low-lying coastal area, making it susceptible to storms and flooding.

Les Cayemites, Rank: 54

Les Cayemites is a collection of two islands, Grande Cayemite and Petite Cayemite, located off the coast of the south-west peninsula. The population is just over 5,000 and located in the Grand-Anse department of Haiti. The microgrid survey of Les Cayemites was undertaken at Pointe Sable from the 11th to 15th of August, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Les Cayemites are fishing and small-scale farming. The businesses interviewed in Les Cayemites all have their own source of generation, consisting almost exclusively of generators. Fuel costs 250 HTG per gallon for gasoline, and 60 HTG per bidon of kerosene. There are approximately 340 buildings that could be potentially connected to a micro-grid in Les Cayemites. The current major energy users in the town are households, the dance club, the church, and a small cinema. With electricity, there potentially could be large demand for refrigeration of the seafood.

Table 62 – Energy Expenditures in Les Cayemites

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	19,000
Weekly Household Expenditures	195,000
Total Weekly Expenditures	214,000
Gasoline and Diesel Consumed Weekly	103

Strength of Community-Based Organizations

There are just a few community-based organizations in town. One serves the church and another promotes town development and festivals.

Accessibility and Potential Setbacks

Accessibility is poor in these two islands. Boats must be taken from the town of Pestel on the mainland, which is accessible via vehicles, but the roads are poor. Once in the main port, Pointe Sand, of Grande Cayemite island, there is no wharf. Additionally, while there are roads in Pointe Sand, they would be difficult to access with trucks. Furthermore, the water in the port area is not deep, which would complicate the docking of any large vessel. Finally, the town of Pointe Sand is low-lying, and periodically flooded by the ocean.

Mont-Organisé, Rank: 54

Mont-Organisé is a town of approximately 19,000 people located in the Nord-Est department of Haiti. The microgrid survey of Mont-Organisé was undertaken from the 17th to 19th of September, 2015.

Energy Expenditures and Business Development Potential

The main economic drivers of Mont-Organisé are agriculture (coffee, peas, cassava, and yam). Both of the businesses interviewed have generation, by generator and solar panel. Fuel costs 250 HTG per gallon of gasoline and 25 HTG per bidon of

kerosene. There are approximately 450 buildings that could potentially be connected to a micro-grid in Mont-Organisé. The current major energy user in the town is the church and some of the businesses.

Table 63 – Energy Expenditures in Mont-Organisé

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	250
Weekly Household Expenditures	51,157
Total Weekly Expenditures	51,407
Gasoline and Diesel Consumed Weekly	3 gallons

Strength of Community-Based Organizations

The community-based organization in Mont-Organisé is involved in rural agriculture, trade and policy. The NGO presence in Mont-Organisé is involved in the training of farmers.

Accessibility and Potential Setbacks

Mont-Organisé is accessible throughout the year. One potential setback for the development of a micro-grid in Mont-Organisé is that the economic drivers are not diverse, indicating possible low demand for energy in the business sector.

Bahon, Rank: 60

Bahon is a town of approximately 21,000 people located in the Nord department of Haiti. The microgrid survey of Bahon was undertaken from the 1st to 4th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Bahon are agriculture (beans, corn, plantains, and cocoa), and raising livestock. Most of the businesses interviewed in Bahon have a grid connection and/or their own source of generation, whether generators or solar panels. This indicates that there is some demand for energy in the business sector. Fuel costs 240 HTG per gallon for gasoline, 250 HTG per gallon of diesel, and 25-75 HTG per bidon of kerosene. There are approximately 400 buildings that could be potentially connected to a micro-grid in Bahon. The current major energy users in the town are the hospital, the school, and the Digicel tower.

Table 64 – Energy Expenditures in Bahon

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	3,982
Weekly Household Expenditures	63,291
Total Weekly Expenditures	67,274
Gasoline and Diesel Consumed Weekly	20 gallons

Bahon has two brownfield microgrids. One of them appears to be managed by EdH. Some of the businesses and households interviewed are connected to the grids, which run 3 days a week for about 2-4 hours per day. Thus, there is some operational energy infrastructure already present in Bahon.

Strength of Community-Based Organizations

There are two community-based organizations in Bahon, serving groups of women and youth, and organizing social activities. Some activities undertaken by NGOs in Bahon include microfinance, education, and health (Red Cross and USAID).

Accessibility and Potential Setbacks

Bahon is accessible by truck; however, the road is difficult to navigate. One of the potential setbacks for the development of a micro-grid in Bahon is the existence of two operational microgrids that already serve some portion of the population. Many of those already connected to electricity are not paying; therefore, it may be difficult to charge other members of the community for electricity. Also, Bahon is located on the bank of a river, making it susceptible to flooding.

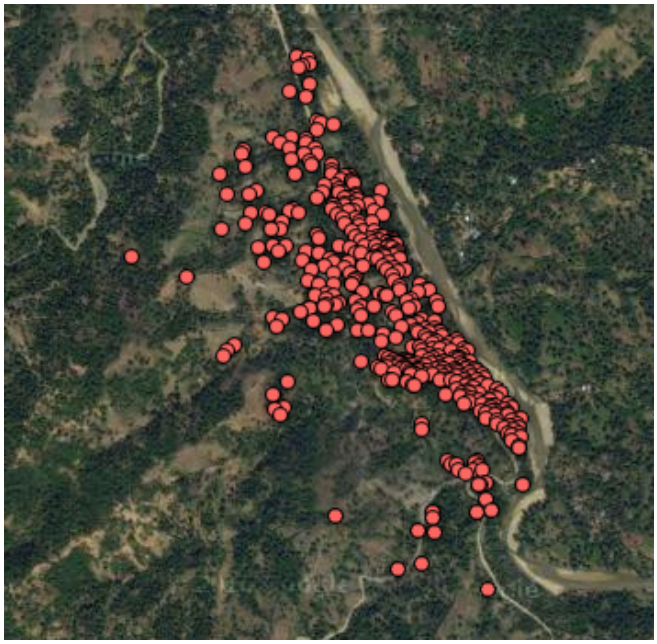

Figure 23 - Potential Connections in Bahon (Map Imagery: Google Earth, DigitalGlobe)

Baie-de-Henne, Rank: 60

Baie-de-Henne is a town of approximately 25,000 people located in the Nord-Ouest department of Haiti. The microgrid survey of Baie-de-Henne was undertaken from the 16th to 19th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Baie-de-Henne are charcoal production and agriculture. However, agricultural production has been severely diminished as a result of severe drought. Most of the businesses interviewed in Baie-de-Henne have

their own source of generation, whether generators or solar panels. This indicates that there is already demand for energy in the business sector. Fuel costs 250-300 HTG per gallon for gasoline, 200-215 HTG per gallon of diesel, and 40-60 HTG per bidon of kerosene. There are approximately 600 buildings that could be potentially connected to a micro-grid in Baie-de-Henne. The current major energy users in the town are the clinic, some of the small businesses with appliances, the nightclub, and the town water pump system.

Table 65 – Energy Expenditures in Baie-de-Henne

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	5,855
Weekly Household Expenditures	117,972
Total Weekly Expenditures	123,827
Gasoline and Diesel Consumed Weekly	35 gallons

Strength of Community-Based Organizations

There are community-based organizations in Baie-de-Henne, serving groups of women by providing professional training, as well as agricultural cooperatives. Some activities undertaken by NGOs in Baie-de-Henne include nutrition, environmental conservation, sanitation, and sponsorship of farmers.

Accessibility and Potential Setbacks

The town is accessible, and the road is difficult for trucks but still navigable. One of the potential setbacks for the development of a micro-grid is that Baie-de-Henne is located in a low-lying coastal area, making it susceptible to flooding.

Grand Saline, Rank: 60

Grand Saline is a town of approximately 21,000 people located in the Artibonite department of Haiti. The microgrid survey of Grand Saline was undertaken from the 20th to 23rd of August, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Grand Saline are fishing, sea salt production and rice production. The businesses interviewed in Grand Saline all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline, and 210 HTG per bidon of kerosene. There are approximately 150 buildings that could be potentially connected to a micro-grid in Grand Saline.

Table 66 – Energy Expenditures in Grand Saline

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	2,800
Weekly Household Expenditures	50,000
Total Weekly Expenditures	53,000

Gasoline and Diesel Consumed Weekly	32 gallons

Grande Saline is partially served by EdH. A few businesses and households reported a grid connection, but none of those connected are receiving any electricity.

Strength of Community-Based Organizations

There are two reported organizations in town. One promotes social and cultural activities with 800 members, and the other promotes civil protection.

Accessibility and Potential Setbacks

Accessibility to the town is poor, especially during rainy periods. Grand Saline is in a low-lying coastal area, making it susceptible to flooding.

Gressier, Rank: 60

Gressier is a town of approximately 33,000 people located in the Ouest department of Haiti. The microgrid survey of Gressier was undertaken from the 11th to 16th of August, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Gressier is tourism. There are approximately 1000 buildings that could be potentially connected to a micro-grid in Gressier. The current major energy users in the town are the hotels and guest houses near the beach.

Table 67 – Energy Expenditures in Gressier

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	175
Weekly Household Expenditures	n/a
Total Weekly Expenditures	175
Gasoline and Diesel Consumed Weekly	0 gal

Gressier has a grid, which operates 3-4 days per week for 3 hours per day, and is operated by EDH.

Accessibility and Potential Setbacks

Accessibility year-round for large trucks is not expected to be a problem. Gressier is in a low-lying coastal area, making it susceptible to flooding.

L'Ïle-à-Vaches, Rank: 60

L'Ïle-à-Vaches is a town of approximately 14,000 people located in the Sud department of Haiti. The microgrid survey of L'Ïle-à-Vaches was undertaken from the 8th to 11th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of L'Ïle-à-Vaches are fishing and tourism. The businesses interviewed in L'Ïle-à-Vaches all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 210 HTG per gallon for gasoline, and 40 HTG per bidon of kerosene. There are approximately 227 buildings that could be potentially connected to a micro-grid in L'Ïle-à-Vaches. The current major energy users in the town are the ice manufacturer, the church, Digicel tower, water pumping station, and the hotels.

Table 68 – Energy Expenditures in L'Ïle-à-Vaches

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	16,000
Weekly Household Expenditures	45,000
Total Weekly Expenditures	61,000
Gasoline and Diesel Consumed Weekly	100 gal

Strength of Community-Based Organizations

There are five community-based organizations representing over 300 individuals in L'Ïle-à-Vaches, serving women, orphans and tourism.

Accessibility and Potential Setbacks

Access to the island is via boat and seas are reported to be reasonably calm. A 10 by 15 meter concrete dock can handle medium-sized cargo. Heavy construction trucks seen operating on the island confirm that it is possible to transport, unload and navigate larger trucks on the island. Further inland on the island, however, the terrain becomes steep and with roads of basic quality, passage of large trucks could be difficult.

La Vallée-de-Jacmel, Rank: 60

La Vallée-de-Jacmel is a town of approximately 36,000 people located in the Sud-Est department of Haiti. The microgrid survey of La Vallée-de-Jacmel was undertaken from the 16th to 20th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of La Vallée-de-Jacmel is agriculture. The businesses interviewed in La Vallée-de-Jacmel all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline, and 75 HTG per bidon of kerosene. There are approximately 100 buildings that could be potentially connected to a micro-grid in La Vallée-de-Jacmel. The current major energy users in the town are the morgue, a hotel and the small businesses.

Table 69 – Energy Expenditures in La Vallée-de-Jacmel

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	5,300
Weekly Household Expenditures	8,500
Total Weekly Expenditures	13,800
Gasoline and Diesel Consumed Weekly	22 gal

Strength of Community-Based Organizations

Three community-based organizations in La Vallée-de-Jacmel were identified, addressing issues such as training for women, gender equity and health care

Accessibility and Potential Setbacks

The road is currently accessible via motorcycle, but is under construction, and presumably should be accessible by larger vehicles upon completion.

Ranquitte, Rank: 60

Ranquitte is a town of approximately 25,000 people located in the Nord department of Haiti. The microgrid survey of Ranquitte was undertaken from the 3rd to 5th of September, 2015.

Energy Expenditures and Business Development Potential

The main economic drivers of Ranquitte are markets and boutiques. Other drivers are agriculture and animal husbandry. One of the two businesses interviewed have a gasoline generator. Fuel costs 230-240 HTG per gallon of gasoline, and 25-60 HTG per bidon of kerosene. There are approximately 220 buildings that could potentially be connected to a micro-grid in Ranquitte. The current major energy users in the town are the morgue, church, community organizations.

Table 70 – Energy Expenditures in Ranquitte

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	530
Weekly Household Expenditures	31,875
Total Weekly Expenditures	32,405
Gasoline and Diesel Consumed Weekly	2 gallons

Ranquitte has a brownfield microgrid. Some of the community organizations and households interviewed are connected to the grid which runs for 1-4 hours per day, 1-3 days per week. Thus, there is some energy infrastructure already present in Ranquitte.

Strength of Community-Based Organizations

There are two community-based organizations in Ranquitte which focus on rural farming soil and agricultural products, and education in micro-credit. Some activities undertaken by NGOs in Ranquitte include road repairs, irrigation, and sanitation.

Accessibility and Potential Setbacks

One potential setbacks for the development of a micro-grid in Ranquitte is the fragility or lack of road infrastructure which makes access difficult for large trucks.

Chantal, Rank: 67

Chantal is a town of approximately 31,000 people located in the Sud department of Haiti. The microgrid survey of Chantal was undertaken from the 12th to 14th of August, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Chantal are agriculture (corn, potatoes, and pistachios) and business. About half of the businesses interviewed in Chantal have either a grid connection or their own source of generation, whether generators or solar panels. This indicates that there is already some demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline and 35-50 HTG per bidon of kerosene. There are approximately 200 buildings that could be potentially connected to a micro-grid in Chantal. The current major energy users in the town are the churches, the schools, and the clinic.

Table 71 – Energy Expenditures in Chantal

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	1897
Weekly Household Expenditures	18866
Total Weekly Expenditures	20763
Gasoline and Diesel Consumed Weekly	3 gallons

Chantal has is partially served by EdH. Some of the businesses and households interviewed are connected to the grid, which runs every day for 4-8 hours. Thus, there is some operational energy infrastructure already present in Chantal.

Strength of Community-Based Organizations

There are two community-based organizations in Chantal, focusing on economic development. Some activities undertaken by NGOs in Chantal include business sponsorship or funds to send children to school.

Accessibility and Potential Setbacks

Chantal is easily accessible. One of the potential setbacks for the development of a micro-grid in Chantal is the presence of a lot of trees – this could limit potential sites for solar generation. Also, Chantal is located near a large river, making it susceptible to flooding.

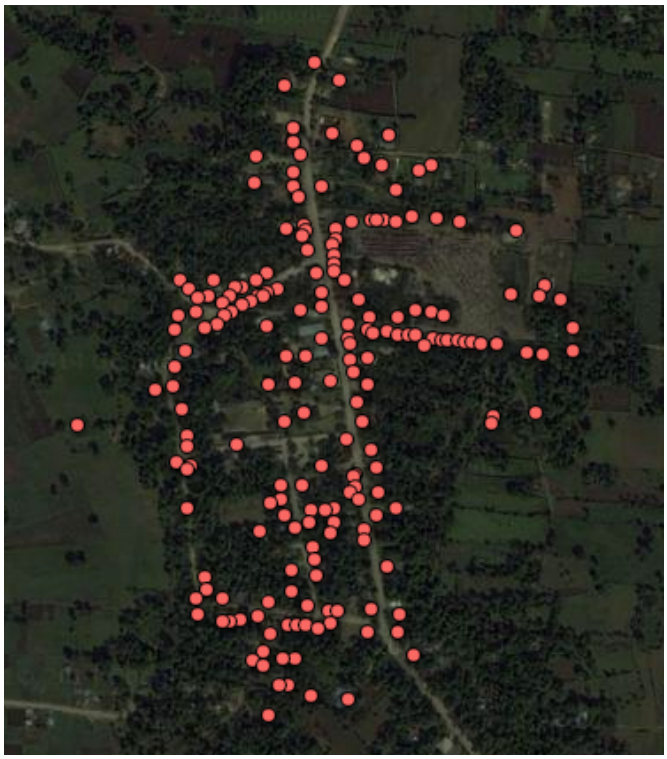

Figure 24 – Potential Connections in Chantal (Map Imagery: Google Earth, DigitalGlobe)

Cornillon, Rank: 67

Cornillon is a town of approximately 54,000 people located in the Ouest department of Haiti. The microgrid survey of Cornillon was undertaken from the 10th to 12th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Cornillon is agriculture (corn, beans, avocado, and millet). All of the businesses interviewed in Cornillon have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline, 200-250 HTG per gallon of diesel, and 15-25 HTG per bidon of kerosene. There are approximately 300 buildings that could be potentially connected to a micro-grid in Cornillon. The current major energy users in the town are the community radio station, the barber shop, and a multi service.

Table 72 – Energy Expenditures in Cornillon

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	8,255
Weekly Household Expenditures	43,148
Total Weekly Expenditures	51,403
Gasoline and Diesel Consumed Weekly	47 gallons

Strength of Community-Based Organizations

There are community-based organizations in Cornillon, serving groups of women, youth, and focusing on sustainable development. Some activities undertaken by NGOs in Cornillon include sanitation, agriculture, livestock, and social activities (Oxfam).

Accessibility and Potential Setbacks

Cornillon is accessible, although there may be some difficulty with large trucks. One of the potential setbacks for the development of a micro-grid in Cornillon is a lack of sunlight, and that there is no real town center or high-density area.

Fonds-Verrettes, Rank: 67

Fonds-Verrettes is a town of approximately 45,000 people located in the Ouest department of Haiti. The microgrid survey of Fonds-Verrettes was undertaken from the 2nd to 5th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Fonds-Verrettes is agriculture.The businesses interviewed in Fonds-Verrettes all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Average fuel costs is 230 HTG per gallon for gasoline. There are approximately 300 buildings that could be potentially connected to a micro-grid in Fonds-Verrettes. The current major energy users in the town are bakeries, hotels and a radio station.

Table 73 – Energy Expenditures in Fonds-Verrettes

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	12,000
Weekly Household Expenditures	49,000
Total Weekly Expenditures	62,000
Gasoline and Diesel Consumed Weekly	64 gal

Strength of Community-Based Organizations

There are at least two community-based organizations in Fonds-Verrettes, serving groups of farmers and women.

Accessibility and Potential Setbacks

Access to the town is good. Large trucks should be able to reach the town at any time of the year. Fonds-Verrettes is located on the bank of a river, making is susceptible to flooding.

Mombin-Crochu, Rank: 67

Mombin-Crochu is a town of approximately 32,000 people located in the Nord-Est department of Haiti. The microgrid survey of Mombin-Crochu was undertaken from the 15th to 18th of September, 2015.

Energy Expenditures and Business Development Potential

The main economic driver of Mombin-Crochu is agriculture. Some of the businesses interviewed have generation, by either grid connection or solar panel. Fuel costs 25-70 HTG per bidon of kerosene. There are approximately 250 buildings that could potentially be connected to a micro-grid in Mombin-Crochu. The current major energy user in the town is the business complex Fierté Mombinoise.

Table 74 – Energy Expenditures in Mombin-Crochu

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	60
Weekly Household Expenditures	76,791
Total Weekly Expenditures	76,851
Gasoline and Diesel Consumed Weekly	0 gallons

Mombin-Crochu has a brownfield microgrid, which is operated by the Digicel tower. One of the three businesses and one of the households interviewed are connected to the grid, which functions 3 hours a day, 2 days per week for the household, and 24 hours per day, 7 days per week for the business.

Strength of Community-Based Organizations

There are some community-based organizations in Mombin-Crochu which partake in agricultural storage, training, commerce, and social solidarity. NGO activities in Mombin-Crochu are in the sectors of conservation, agro-ecological work, agricultural work such as producing seeds and transporting mangos, and micro-credit.

Accessibility and Potential Setbacks

One potential setback for the development of a micro-grid in Mombin-Crochu is that the accessibility of the city via the one lane road may be low especially in the rainy period. Another the potential setback is that EDH has already recently installed their power supply in the town.

Pestel, Rank: 67

Pestel is a town of approximately 41,000 people located in the Grand'Anse department of Haiti. The microgrid survey of Pestel was undertaken from the 11th to 14th of August, 2015.

Energy Expenditures and Business Development Potential

Despite its size, Pestel is bustling with economic activity. Among the main economic drivers in Pestel are agriculture (cassava, bananas, yams, and corn), fishing, husbandry, and trade. About a quarter of the businesses interviewed in Pestel have their own source of generation, whether generators or solar panels. According to one of the main clinic's department heads, the clinic has a nonfunctional generator, which could potentially "light the entire town of Pestel." This indicates a high energy demand in the business sector. Fuel costs 250 HTG per gallon for gasoline, 150 HTG

per gallon for diesel, and 25-30 HTG per bidon for kerosene. There are approximately 150 buildings that could be potentially connected to a microgrid in Pestel. The current major energy users in the town are health centers, phone charging services, a hotel, and a carpentry business.

Table 75 – Energy Expenditures in Pestel

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	12,110
Weekly Household Expenditures	20,991
Total Weekly Expenditures	33,101
Gasoline and Diesel Consumed Weekly	49 gallons

Strength of Community-Based Organizations

There are a number of community-based organizations in Pestel, serving the town's youth. Some activities undertaken by NGOs in Pestel include providing health counseling, teacher training, and child education.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Pestel is the dirt roads, which could make access to the town with large trucks difficult.

Plaisance-du-Sud, Rank: 67

Plaisance-du-Sud is a town of approximately 25,000 people located in the Nippes department of Haiti. The microgrid survey of Plaisance-du-Sud was undertaken from the 12th to 13th of August, 2015, and again from 29th September to 2nd October, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Plaisance-du-Sud is agriculture and animal husbandry, but the situation seems precarious. Agricultural goods are transported to economic centers by livestock. Most businesses interviewed in Plaisance-du-Sud have a diesel or gasoline generator, indicating a high demand for energy in the business sector. Fuel costs 160-250 HTG per gallon of gasoline or diesel fuel, and 35-60 HTG per bidon of kerosene. There are approximately 140 buildings that could potentially be connected to a micro-grid in Plaisance-du-Sud. The current major energy users in the town are the health center, the mini market Kolibri, and other certain community organizations and personal businesses.

Table 76 – Energy Expenditures in Plaisance-du-Sud

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	4,434
Weekly Household Expenditures	13,803
Total Weekly Expenditures	18,237

Gasoline and Diesel Consumed Weekly	23 gallons

Strength of Community-Based Organizations

NGO activities in Plaisance-du-Sud include providing agricultural aid by the way of subsidized seeds and lending to farmers for building fields and stockpiling crops, helping children, and working in health and potable water.

Accessibility

The road infrastructure to Plaisance-du-Sud can support traffic of large trucks all year round. Potential setbacks for the development of a micro-grid in Plaisance-du-Sud are that the homes are scattered in the mountains and trees, there are no electrical installations, and there is a lot of land conflict in the area.

Pointe-à-Raquette (La Gonave), Rank: 67

Pointe-à-Raquette is a town of approximately 22,000 people located in the Ouest department of Haiti. The microgrid survey of Pointe-à-Raquette was undertaken from the 20th to 21th of August, 2015, and again on the 19th of October, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Pointe-à-Raquette is fishing. Other interesting economic structures include agriculture, retail and tourism. One of two businesses interviewed has a diesel generator and the other has solar panels, possibly indicating a high demand for energy in the business sector. Fuel costs 200 HTG per gallon of diesel, 225 HTG per gallon of gasoline, and about 50 HTG per bidon of kerosene. There are approximately 400 buildings that could potentially be connected to a micro-grid in Pointe-à-Raquette. The current major energy users in the town are the night clubs, multi service shops, and markets.

Table 77 – Energy Expenditures in Pointe-à-Raquette

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	3,600
Weekly Household Expenditures	85,121
Total Weekly Expenditures	88,721
Gasoline and Diesel Consumed Weekly	31 gallons

Strength of Community-Based Organizations

NGO activities in Pointe-à-Raquette seem strong and include providing sponsorship, aiding children, fishermen, training for animal husbandry. Some other sectors of NGO aid include water, health, education, and nutrition.

Accessibility

The best access to Pointe-à-Raquette is by sea, although there is no river through the town. Roads could support traffic of large trucks if the degradation of the roads is kept in mind moving forward. A potential setback for the development of a micro-grid in Pointe-à-Raquette is that agriculture being a large constituent of the

economy, the heavy dependence on rainfall could change the financial situation of the micro-grid operation in the event of rainfall changes.

Roseaux, Rank: 67

Roseaux is a town of approximately 33,000 people located in the Grand'Anse department of Haiti. The microgrid survey of Roseaux was undertaken from the 27th of September to 4th of October, 2015.

Energy Expenditures and Business Development Potential

The main economic drivers of Roseaux are fishing and agriculture. Other drivers are commerce and boat transportation services. All of the businesses interviewed have their own source of generation, whether generators or solar panels, indicating an already high demand for energy in the business sector. Fuel costs 200-250 HTG per gallon of gasoline, 150-200 HTG per gallon of diesel, and 25-60 HTG per bidon of kerosene. There are approximately 340 buildings that could potentially be connected to a micro-grid in Roseaux. The current major energy users in the town are the bar and the restaurant.

Table 78 – Energy Expenditures in Roseaux

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	17,480
Weekly Household Expenditures	90,560
Total Weekly Expenditures	108,040
Gasoline and Diesel Consumed Weekly	87 gallons

Strength of Community-Based Organizations

There are several community-based organizations in Roseaux which focus on many activities including commerce with women, youth training, agriculture, animal husbandry, AIDS support, fishing, and jam and cocoa cream production. NGO presence is strong in Roseaux, and some activities undertaken by the NGOs include youth training, health, education, social work, nutrition aid, and disaster and risk management.

Accessibility and Potential Setbacks

Accessibility is good in and to Roseaux all year round. One potential setback for the development of a micro-grid in Roseaux is hindrance from bad marine weather due to Roseaux's proximity to the ocean.

Bois de Laurence, Rank: 75

Bois de Laurence is a town of approximately 20,000 people located in the Nord-Est department of Haiti. The microgrid survey of Bois de Laurence was undertaken from the 30th of September to the 2nd of October, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Bois de Laurence is agriculture (plantains, beans, and avocados). There are no businesses. Fuel costs 250 HTG per gallon of diesel, and 25

HTG per bidon of kerosene. There are approximately 500 buildings that could be potentially connected to a micro-grid in Bois de Laurence. The current major energy users in the town are the Presbyterian church and the community farming association.

Table 79 – Energy Expenditures in Bois de Laurence

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	500
Weekly Household Expenditures	28,240
Total Weekly Expenditures	28,740
Gasoline and Diesel Consumed Weekly	2 gallons

Strength of Community-Based Organizations

There is one community-based organization in Bois de Laurence, which is an association of farmers. There is an NGO in Bois de Laurence that provides training for farmers, particularly with respect to ecologically sound agricultural practices.

Accessibility and Potential Setbacks

Some potential setbacks for the development of a micro-grid in Bois de Laurence are: the buildings are spread out in a hilly region, and that all land in the town is privately owned. Accessibility to the town is difficult, dangerous, and not possible year round. Also, it is not possible to access Bois de Laurence with large trucks.

Carice, Rank: 75

Carice is a town of approximately 12,000 people located in the Nord-Est department of Haiti. The microgrid survey of Carice was undertaken from the 21st to 26th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Carice are the market (every Wednesday), a couple of shops, and the discos. Almost all of the businesses interviewed in Carice have their own source of generation, whether generators or solar panels. This indicates that there is already high demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline, 157-200 HTG per gallon of diesel, and 25-30 HTG per bidon of kerosene. There are approximately 350 buildings that could be potentially connected to a micro-grid in Carice. The current major energy users in the town are the business listed above.

Table 80 – Energy Expenditures in Carice

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	8,626
Weekly Household Expenditures	47,453
Total Weekly Expenditures	56,079

Gasoline and Diesel Consumed Weekly	50 gallons

Strength of Community-Based Organizations

There is a community-based organization in Carice, serving a group of farmers. The NGO presence in Carice focuses on reforestation.

Accessibility and Potential Setbacks

Carice is accessible by truck, although the route is difficult in some areas. One of the potential setbacks for the development of a micro-grid in Carice is the fact that many households already possess their own generation, particularly solar home systems. Also, Carice is located in between two rivers, making it susceptible to flooding.

Grand-Gosier, Rank: 75

Grand-Gosier is a town of approximately 15,000 people located in the Sud-Est department of Haiti. The microgrid survey of Grand-Gosier was undertaken from the 16th to 19th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Grand-Gosier are agriculture, fishing and livestock. The businesses interviewed in Grand-Gosier all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200-250 HTG per gallon for gasoline, and 25-30 HTG per bidon of kerosene. There are approximately 60 buildings that could be potentially connected to a micro-grid in Grand-Gosier. The current major energy users in the town are restaurants and small vendors with refrigerated soft drinks.

Table 81 – Energy Expenditures in Grand-Gosier

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	11,000
Weekly Household Expenditures	14,000
Total Weekly Expenditures	25,000
Gasoline and Diesel Consumed Weekly	83 gallons

Strength of Community-Based Organizations

There are four community-based organizations in Grand-Gosier, serving groups of fishermen, women, and the youth.

Accessibility and Potential Setbacks

The road is accessible for large trucks. As for potential setbacks, population density is low in the town, but in the Mare Joffrey part of town, population density is notably high. Grand-Gosier is located in a low-lying coastal area, making it susceptible to flooding and storms.

La Victoire, Rank: 75

La Victoire is a town of approximately 9,500 people located in the Nord department of Haiti. The microgrid survey of La Victoire was undertaken from the 9th to 11th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of La Victoire is agriculture. One business interviewed did not have a generator or solar panels, but did consume kerosene, for which it paid 25 HTG per bidon. There are approximately 150 buildings that could be potentially connected to a micro-grid in La Victoire.

Table 82 – Energy Expenditures in La Victoire

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	200
Weekly Household Expenditures	15,000
Total Weekly Expenditures	15,200
Gasoline and Diesel Consumed Weekly	0 gal

La Victoire has a brownfield microgrid that, according to one business owner, runs on average one day a week for 10 hours. The grid is managed by the mayor's office.

Strength of Community-Based Organizations

A women's organization of 500 members supports women's efforts to engage in trade and commerce.

Accessibility and Potential Setbacks

Reports of land conflict could be one potential source of setbacks to microgrid development. In terms of accessibility, large trucks can access the town, but will need to exercise caution, and may not have access year-round.

Marfranc, Rank: 75

Marfranc is a town located in the Grand-Anse department of Haiti. The microgrid survey of Marfranc was undertaken from the 20th to 22nd of August, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Marfranc is agriculture (plantains, maize, and sugar cane). The businesses interviewed in Marfranc all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline, and 25-30 HTG per bidon of kerosene. There are approximately 539 buildings that could be potentially connected to a micro-grid in Marfranc. The current major energy users in the town are the mill (corn, cane, and coffee) and the school.

Table 83 – Energy Expenditures in Marfranc

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	2,225
Weekly Household Expenditures	130,000
Total Weekly Expenditures	133,000
Gasoline and Diesel Consumed Weekly	29 gal

Strength of Community-Based Organizations

Two community-based organizations were identified. One provides primary emergency medical care, and the other is a school.

Accessibility and Potential Setbacks

The road to the town is not paved, but large buses and trucks still manage to navigate the route. Marfranc is located on the bank of a river, making it susceptible to flooding.

Terre-Neuve, Rank: 80

Terre-Neuve is a town of approximately 28,000 people located in the Artibonite department of Haiti. The microgrid survey of Terre-Neuve was undertaken from the 22nd to 26th of August, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Terre-Neuve are agriculture (corn, chickpeas, millet), livestock and microcommerce. Most of the businesses interviewed in Terre-Neuve have their own source of generation, whether generators or solar panels. This indicates that there is a relatively high demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline, 250 HTG per gallon of diesel, and 50 - 60 HTG per bidon of kerosene. There are approximately 150 buildings that could be potentially connected to a micro-grid in Terre-Neuve. Currently, the local hospital is the major energy user in town.

Table 84 – Energy Expenditures in Terre-Neuve

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	15,310
Weekly Household Expenditures	32,706
Total Weekly Expenditures	48,016
Gasoline and Diesel Consumed Weekly	75 gallons

Strength of Community-Based Organizations

There are a number of community-based organizations in Terre-Neuve, serving groups of women and youth. There are several NGOs present in Terre-Neuve, most of which are dedicated towards organizing health and nutrition programs.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a microgrid in Terre-Neuve is the poor quality of mountainous roads, which could make access to the town with large trucks difficult. Occasional cyclones also cause nearby rivers to flood, making accessibility even more difficult.

Casse, Rank: 81

Casse is a town located in the Sud department of Haiti. The microgrid survey of Casse was undertaken from the 10th to 14th of August, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Casse is agriculture (rice, corn, and beans). About half of the businesses interviewed in Casse have their own source of generation, whether generators or solar panels. This indicates that there is already some demand for energy in the business sector. Fuel costs 200-250 HTG per gallon for gasoline and 15-40 HTG per bidon of kerosene. There are approximately 200 buildings that could be potentially connected to a micro-grid in Casse. The current major energy user is one shop that has a solar-powered icemaker.

Table 85 – Energy Expenditures in Casse

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	3,450
Weekly Household Expenditures	70,245
Total Weekly Expenditures	73,695
Gasoline and Diesel Consumed Weekly	38 gallons

Strength of Community-Based Organizations

There are two community-based organizations in Casse, serving groups of farmers. There is an NGO in Casse that focuses on mango grafting.

Accessibility and Potential Setbacks

Casse is easily accessible. One of the potential setbacks for the development of a micro-grid in Casse is theft of solar panels – according to the residents of the town this is already a problem. Also, Casse is located near to a river, making it susceptible to flooding.

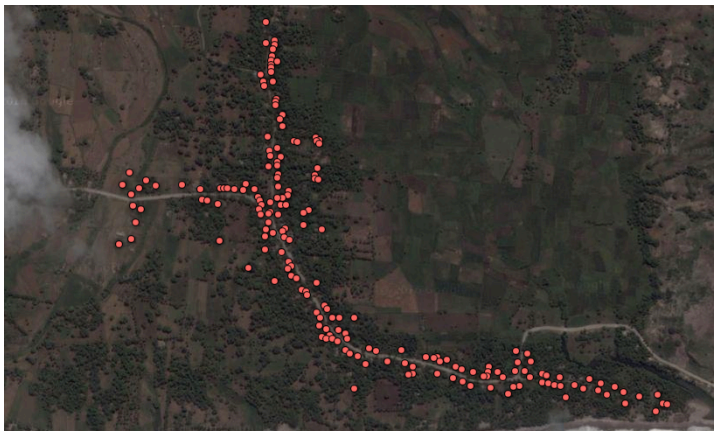

Figure 25 – Potential Connections in Casse (Map Imagery: Google Earth, DigitalGlobe)

Savanette, Rank: 81

Savanette is a town of approximately 33,000 people located in the Centre department of Haiti. The microgrid survey of Savanette was undertaken from the 2nd to 5th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Savanette is commerce. There is a market every day, with a large one once a week where a variety of items are sold, from food provisions to solar panels.

Almost all of the businesses interviewed in Savanette have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 250 HTG per gallon of gasoline, 225-250 HTG per gallon of diesel, and 25-80 HTG per bidon of kerosene. There are approximately 450 buildings that could be potentially connected to a micro-grid in Savanette. The current major energy users in the town are the factory for Sapibon, the Catholic church, and a company which freezes meat.

Table 86 - Energy Expenditures in Savanette

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	6,570
Weekly Household Expenditures	80,649
Total Weekly Expenditures	87,219
Gasoline and Diesel Consumed Weekly	37 gallons

Strength of Community-Based Organizations

There is one community-based organization in in Savanette, which organizes professional training for women. Some activities undertaken by NGOs in Savanette include reforestation, irrigation, water and sanitation.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Savanette is difficult road accessibility for large trucks. Additionally, Savanette is located adjacent to a river, making it susceptible to flooding

Abricot, Rank: 83

Abricot is a town of approximately 25,000 people located in the Grand-Anse department of Haiti. The microgrid survey of Abricot was undertaken from the 18th to 22nd of August, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Abricot are agriculture (plantains, yams, and sugar cane) and fishing. The businesses interviewed in Abricot all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline, and 25-30 HTG per bidon of kerosene. There are approximately 150 buildings that could be potentially connected to a micro-grid in Abricot. The current major energy users in the town are Digicel, Natcom, the churches, and the fishermen's association.

Table 87 – Energy Expenditures in Abricot

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	2,955
Weekly Household Expenditures	15,437
Total Weekly Expenditures	18,392
Gasoline and Diesel Consumed Weekly	14 gallons

Abricot has a brownfield microgrid. Some of the businesses and households interviewed are connected to the grid, but it no longer functions. Thus, there is some energy infrastructure already present in Abricot.

Strength of Community-Based Organizations

There are a number of community-based organizations in Abricot, serving groups of fishermen and women. Some activities undertaken by NGOs in Abricot include education, post-earthquake reconstruction, and the provision of supplies to both farmers and fishers.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Abricot is the poor quality of the roads, which could make access to the town with large trucks difficult, especially in the rainy season. Also, Abricot is located in a low-lying coastal area, making it susceptible to flooding.

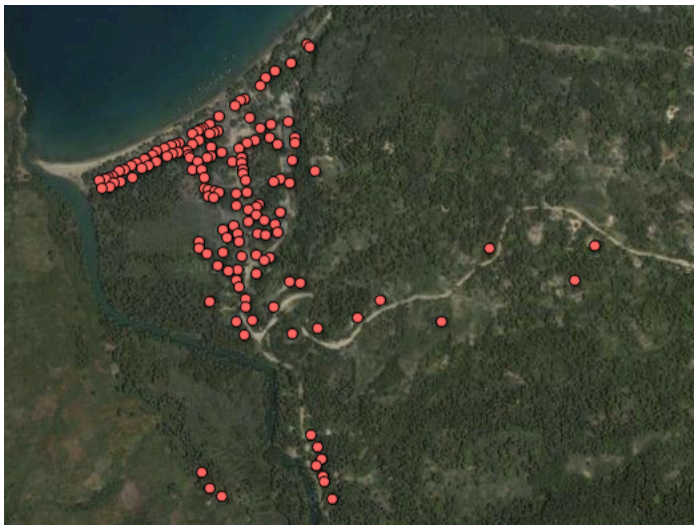

Figure 26 – Potential Connections in Abricot (Map Imagery: Google Earth, DigitalGlobe)

Corail, Rank: 83

Corail is a town of approximately 18,000 people located in the Grand-Anse department of Haiti. The microgrid survey of Corail was undertaken from the 13th to 17th of August, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Corail is agriculture (plantains, yucca, and beans). All of the businesses interviewed in Corail have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 200 HTG per gallon of diesel and 15-30 HTG per bidon of kerosene. There are approximately 500 buildings that could be potentially connected to a micro-grid in Corail. The current major energy user in the town is a store selling cold beverages.

Table 88 – Energy Expenditures in Corail

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	14,225
Weekly Household Expenditures	26,505
Total Weekly Expenditures	40,730
Gasoline and Diesel Consumed Weekly	70 gallons

Strength of Community-Based Organizations

There is one community-based organization in Corail, which focuses on sanitation. NGOs in Corail focus on education (CARE) and health.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Corail is accessibility – the road leading to Corail is in poor shape. However, Corail is also

accessible by boat. Corail is located in a low-lying coastal area, making it susceptible to flooding.

Figure 27 – Potential Connections in Corail (Map Imagery: Google Earth, DigitalGlobe)

Randel, Rank: 85

Randel is a town located in the Sud department of Haiti. The microgrid survey of Randel was undertaken from the 12th to 15th of August, 2015.

Energy Expenditures and Business Development Potential

The main economic drivers of Randel are agriculture and small business. Sales of agricultural products, refrigerated food, and gas products are also found. Most of the businesses single business interviewed have some kind of generation, whether generator, solar panel, or kerosene, indicating a high demand for energy in the business sector. Fuel costs 200-250 HTG per gallon of gasoline, 175-250 HTG per gallon of diesel, and 25-60 HTG per bidon of kerosene. There are approximately 217 buildings that could potentially be connected to a micro-grid in Randel. The current major energy users in the town are the retail stores, the church, and the community organizations.

Table 89 – Energy Expenditures in Randel

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	3,990
Weekly Household Expenditures	13,771
Total Weekly Expenditures	19,266
Gasoline and Diesel Consumed Weekly	18 gallons

Randel has a brownfield microgrid. The clinic has excess generation capacity which it has used to connect some of the households. According to those interviewed, the grid runs for 3-24 hours per day, 3-7 days per week. Thus, there is some energy infrastructure already present in Randel.

Strength of Community-Based Organizations

There are a few community-based organizations in Randel, focusing on aiding women through training and supporting agriculture through seedling growth, cooperatives, and training. Some activities undertaken by NGOs in Randel include reforestation, soil conservation, and other environmental protection.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Randel is the accessibility, which is very difficult. During hurricane season, it is not possible to cross the river which runs through the city. Another potential setback is there is no phone signal, potentially making communication difficult.

Cahouane, Rank: 86

Cahouane is a town of approximately 13,000 people located in the Sud department of Haiti. The microgrid survey of Cahouane was undertaken from the 8th to 12th of September, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Cahouane are agriculture (beans, corn, and plantains) and one shop. Some of the businesses interviewed in Cahouane have their own source of generation, whether generators or solar panels. This indicates that there is already some demand for energy in the business sector. Fuel costs 250 HTG per gallon for gasoline, 200 HTG per gallon of diesel, and 30-60 HTG per bidon of kerosene. There are approximately 200 buildings that could be potentially connected to a micro-grid in Cahouane. The current major energy users in the town are the Digicel and Natcom towers.

Table 90 – Energy Expenditures in Cahouane

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	680
Weekly Household Expenditures	9,490
Total Weekly Expenditures	10,170
Gasoline and Diesel Consumed Weekly	3 gallons

Strength of Community-Based Organizations

There are two community-based organizations in Cahouane, supporting farmers and parents who want to send their children to school. Some activities undertaken by NGOs in Cahouane include aid provision, and education.

Accessibility and Potential Setbacks

Cahouane is accessible by large trucks, although the road is not paved. One of the potential setbacks for the development of a micro-grid in Cahouane is a lack of commercial and economic activity. There is no market, and very little in the way of business activity recorded over the course of the survey. Also, Cahouane is located in a low-lying coastal area, making it susceptible to flooding.

Figure 28 - Potential Connections in Cahouane (Map Imagery: Google Earth, DigitalGlobe)

Petit Bourg de Port Margot, Rank: 86

Petit Bourg de Port Margot is a small town located in the Nord department of Haiti. The microgrid survey of Petit Bourg de Port Margot was undertaken from the September 28th to October 3rd, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Petit Bourg de Port Margot are small-scale shops. The businesses interviewed in Petit Bourg de Port Margot all have their own source of generation, whether generators or solar panels. This indicates that there is already a high demand for energy in the business sector. Fuel costs 220 HTG per gallon for gasoline. There are approximately 150 buildings that could be potentially connected to a micro-grid in Petit Bourg de Port Margot. The current major energy users in the town are the hospital and the school.

Table 91 – Energy Expenditures in Petit Bourg de Port Margot

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	900
Weekly Household Expenditures	30,000
Total Weekly Expenditures	31,000
Gasoline and Diesel Consumed Weekly	17 gal

Petit Bourg de Port Margot is partially connected to EdH. The grid operates approximately 2 days per week for 2-5 hours per day.

Strength of Community-Based Organizations

One youth community-based organization was identified, focusing on training, cultural activities and reforestation.

Accessibility and Potential Setbacks

No potential setbacks were identified. The town is located all along the bank of a river, making it particularly susceptible in the event of a flood.

Carcasse, Rank: 88

Carcasse is a town located in the Grand-Anse department of Haiti. The microgrid survey of Carcasse was undertaken from the 2nd to 5th of August, 2015.

Energy Expenditures and Business Development Potential

The major economic driver of Carcasse is fishing. About half of all of the businesses interviewed in Carcasse have their own source of generation, whether generators or solar panels. This indicates that there is already some demand for energy in the business sector. Fuel costs 200-300 HTG per bidon of kerosene. There are approximately 150 buildings that could be potentially connected to a micro-grid in Carcasse. The current major energy users in the town are the two nightclubs and the churches.

Table 92 – Energy Expenditures in Carcasse

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	227
Weekly Household Expenditures	4,403
Total Weekly Expenditures	4,630
Gasoline and Diesel Consumed Weekly	7 gallons

Strength of Community-Based Organizations

There is an agricultural association based in Carcasse. Some activities undertaken by NGOs in Carcasse include health (Red Cross), and establishing supply chains to sell coco abroad.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Carcasse accessibility – the roads leading to Carcasse are in very poor condition and have been damaged by heavy rains. Also, Carcasse is located in a low-lying coastal area, making it susceptible to flooding.

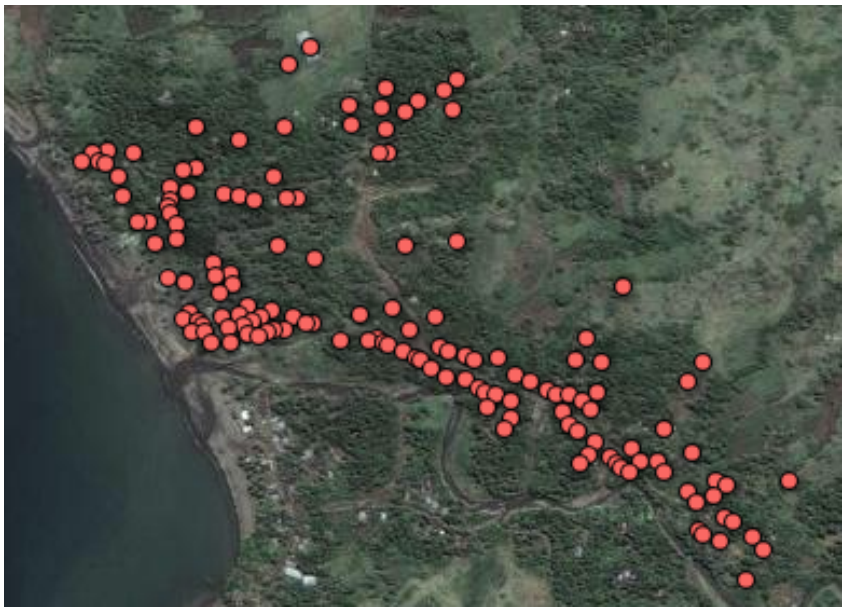

Figure 29 – Potential Connections in Carcasse (Map Imagery: Google Earth, DigitalGlobe)

Chambellan, Rank: 89

Chambellan is a town of approximately 24,000 people located in the Grand-Anse department of Haiti. The microgrid survey of Chambellan was undertaken from the 20th to the 22nd of August, 2015.

Energy Expenditures and Business Development Potential

The major economic drivers of Chambellan are the town market and growing cocoa. About half of the businesses interviewed in Chambellan have their own source of generation, whether generators or solar panels. This indicates that there is already some demand for energy in the business sector. Fuel costs 195-250 HTG per gallon for gasoline, 157 HTG per gallon of diesel, and 50-60 HTG per bidon of kerosene. There are approximately 400 buildings that could be potentially connected to a micro-grid in Chambellan. The current major energy users are the market, the bar, and the welders.

Table 93 – Energy Expenditures in Chambellan

Expenditure Type	Amount (HTG)
Weekly Business Expenditures	n/a
Weekly Household Expenditures	7,050
Total Weekly Expenditures	7,050
Gasoline and Diesel Consumed Weekly	0 gallons

Chambellan has a brownfield microgrid, managed by a local committee. The grid no longer functions. Thus, there is some energy infrastructure already present in Chambellan.

Strength of Community-Based Organizations

There are two community-based organizations in Chambellan, one which is an agricultural cooperative (cocoa and coffee) and the other which supports good governance in Grand-Anse. There is no documented NGO presence in Chambellan.

Accessibility and Potential Setbacks

One of the potential setbacks for the development of a micro-grid in Chambellan is political. The generator that served the now defunct grid in Chambellan was actually installed in Moron, and there are some tensions between the two towns about the transparency behind the management of said generator. Also, Chambellan is located along the bank of a river, making it susceptible to flooding. Accessibility is also difficult, with a perilous road to Chambellan that is broken up by rivers.

Prospective U.S. Sources of Supply

The information gathered and analyzed in this project removes one of the significant barriers to foreign direct investment in Haiti: the dearth of information on the market for micro-grid development. Now, with greater clarity on the towns that are most suitable for grid development and the characteristics of those towns that will inform grid design, project developers can now more easily move forward with implementation.

Two categories of investment opportunities lie in clean energy services and equipment. The first is in micro-grid development. Examples of foreign products and services include solar panels, engineering procurement and construction services, electrical grid operator services, power electronics equipment, cabling and batteries. A second category of investment opportunities lies in the export of electrical appliances, such as fans, refrigerators and agricultural processing equipment.

The estimated per-grid cost for US-sourced goods and services would be about $500,000. Major potential suppliers include the companies that provided the Les Anglais equipment:

- ZeroBase Energy LLC (EPC, Michigan),
- Princeton Power (Power electronics, New Jersey),
- Trojan Battery Company (batteries, California),
- Midnite Solar (electrical connection equipment, Washington State),
- Outback Power (battery racking, Washington State),
- Iron Ridge (Solar racking, California),
- SolarWorld (solar panels, Oregon), and
- SparkMeter (smart metering technology and billing services, Washington, D.C.)