Introduction

University Park, Maryland, is a small town of 2,318 residents, 923 homes, 2 churches, 1 school, 1 town hall, and 1 big goal: to become a model for other small towns across America seeking to reduce their energy use and carbon footprint by 20% or more.

University Park (UP) has established momentum in energy conservation: Recovery Act funds are being used to undertake an energy retrofit of town hall, the town runs a regular commuter bus to the nearby metro station, and UP has community-wide recycling and leaf composting programs. A community Co-op has recently formed to develop rooftop solar arrays on the local school and church, and this year the town Christmas tree will be lit with LED lights from a mobile solar power source.

Building on this foundation, and with support from the U.S. Department of Energy, University Park is ready to implement the *Sequential, Transformative Energy Program for University Park (STEP-UP!)*, a $1,425,000 effort to **create a model community energy transformation program that serves as a roadmap to be followed in small towns across the U.S.**

The STEP-UP model is designed for replication in other resource-constrained small towns similar to University Park - a sector largely neglected to date in federal and state energy efficiency outreach programs. STEP-UP provides a full suite of model activities for replication, including: energy audits and retrofits for residential, institutional and public sector buildings, financial incentives (leveraged at 5:1), local community delivery partners, and leading edge but low cost social marketing. STEP-UP also includes highly innovative elements, such as integrated solar and voluntary carbon market applications.

The overall goal of STEP-UP will be to retrofit fully one third of the buildings in University Park, achieving average annual utility bill savings (attributable to the project) of 25%, or $250 per homeowner. The broader project impact goal is to facilitate STEP-UP replication in at least 5 other small towns during the duration of the Recovery Act-funded projects, and in more than 85 other towns in the 3 years following the project. The detailed STEP-UP project outcomes are contained in Appendix G, Project Impact Table.

Project Impact

How will STEP-UP achieve these stretch goals when "successful" efficiency programs typically have community penetration rates of less than 3%? The STEP-UP goals have been derived using a logic model that takes into account the assumptions, resources, and outcomes related to the project.

Assumptions

a) *Small town resources are constrained*: STEP-UP will have to work in places, such as UP, where volunteer Councils face restricted budgets, modest tax bases, and a stretched civic infrastructure. To be replicable in other small towns, STEP-UP *must* minimize additional cost and burden to the town.

b) *UP is a typical small town*. UP homes are of average age (1947), and UP residents are of average middle class means, with median household incomes of $110,000. Among respondents of a baseline survey conducted for this proposal, most residents identified their energy efficiency knowledge as "average". In short, what happens in University Park is replicable in almost any small, middle class town – paving the way for energy efficiency market transformation in this neglected sector.

c) *UP residents are motivated to participate in an energy program:* This assumption was confirmed through the baseline survey, in which 92% of respondents indicated a "very strong" interest in program participation (the highest survey option), despite differing in their motivations to do so (10% home comfort, 50% environmental reasons, 40% lower utility bills). The motion to submit this proposal was passed unanimously at a special session of Council attend by over 30 town residents.

d) *Social marketing works in small communities*: The effective use of social marketing has been proven in leading efficiency programs such as Cambridge, MA and Babylon, NY. University Park has an established spirit of civic participation and neighborly interaction, coupled with active social channels through the school, church, clubs, and town events. By leveraging these community strengths, and having neighbors become program ambassadors, *STEP-UP* can achieve effective outreach without expensive purchased media – a key to replication in other small towns.

e) ***Individual facilitation will be the key to success in small communities***: Unlike broad state-wide or utility efficiency programs, *STEP-UP* can provide UP residents with facilitation at an individual household level. Working directly with each homeowner, the *STEP-UP* Energy Coach can determine the factors that will best motivate program participation. S/he can also identify the particular financial, transaction or information barriers that may be holding back each specific resident. The Energy Coach can then align the best mix of incentives and support to addresses each homeowner's unique situation. This individual support – impossible to provide in a broadcast efficiency program but playing to the strength of UP and other small towns, is the central key to the STEP-UP model.

Figure 1: *Anticipated Barriers to Program Participation and STEP-UP Response Measures*

Anticipated Barriers to Participation	***STEP-UP* Response Measures**
Information Barriers • Lack of general efficiency / product options • Lack of information about individual impact	Ongoing community education, audits User-to-user education, utility bill comparison
Transaction Barriers • Lack of confidence in process / tradespeople • Difficulty locating financing or tradespeople • Timing: efficiency not top of mind at purchase	Transparent, public contractor review process Pre-screen / pre-select trades, directory Coordinate with select trades and realtors
Financial Barriers • Cost of implementation • Efficient products cost more than conventional • Payback period is too long • Efficiency competes with other investments	Up-front financing, repayment options Incremental incentives to bridge cost gap Organize bulk-purchasing to reduce cost Offer time-limited, attractive incentives

f) *Good data is critical to success*: Every STEP-UP activity must include robust baseline, evaluation, measurement, and verification (EM&V) components for determining project impacts and the effectiveness, and cost-effectiveness, of project elements. A commitment to the measurement of results is essential if STEP-UP is to serve as a credible model for other small towns across America.

Resources

STEP-UP will direct **over one third of total program costs** towards direct financial incentives to encourage homeowners to participate in STEP-UP. In addition, STEP-UP will leverage the services and resources of many local program partners in order to drive program participation.

Figure 2: *STEP-UP Leveraging*

STEP-UP Partner	Leveraged Services	Leveraged Resources
Department of Energy	EERE and ENERGY STAR programs DOE "Solution Center" web site	• $1,500 federal tax credit
The Town of University Park	Mayor, Council, town staff STEP-UP Management Council	• UP civic infrastructure • UP resident expertise
Utilities: • PEPCO • Washington Gas • Washington Urban Sanitation (Water)	Utility bill data Smart meter data Street lighting program Direct install program On-bill financing	• $50 ENERGY STAR appliance rebate program average • PEPCO smart meter program • peak reward savings program from PEPCO
Local Financial Institution TBD	Loan management	• $900,000 in private equity for a low interest revolving loan
Alliance to Save Energy	Bulk purchasing Communications and EM&V Energy efficiency consulting	• STEP-UP dissemination via Alliance national network • ASE staff who is UP resident
Maryland Energy Administration (MEA)	Maryland Home Performance with ENERGY STAR program MEA tax incentives	• Renewable energy tax credits • Promotional resources
PG County	School Board solar agreement Student / classroom participation	• PG County renewable energy tax credit
UP Solar Co-op	Rooftop solar array on school	• $20,000 in estimated annual solar co-op dividends to UP
University of Maryland	Communications school Business school	• Student volunteers
Local Real Estate Agents	STEP-UP resource delivery and point of sale audits	• Referrals for green mortgages and home line of credit tools

Immediate Outcomes

As STEP-UP serves motivated residents through the personal facilitation of the Energy Coach and the leveraged services and incentives of its partners, it will lead to the following immediate outcomes:

- Increased awareness among UP residents of the clean energy opportunities available for their home, as well as the related incentives, cost savings and positive environmental impacts;
- A greater level of comfort and trust among UP residents regarding home energy transactions;
- Increased interest among UP residents to invest in home energy retrofits and renewable energy.

Intermediate Outcomes

1. 50% of UP residents will have a PEPCO home assessment with modest "direct install" measures, achieving a 3% reduction in energy use in participating homes;

2. 25% of UP homes will have the Maryland *Home Performance with ENERGY STAR* full audit and retrofit program, achieving a 25% reduction in energy use in participating homes;

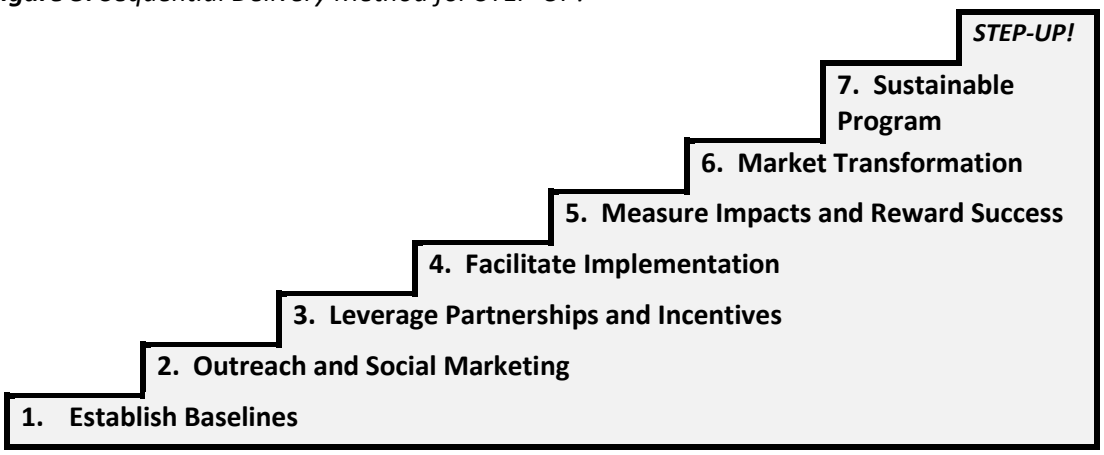
3. An additional 5% reduction in measureable community-wide energy use will be achieved through streetlight retrofits, composting, and a program to reduce vehicle miles travelled (VMT);

4. 5% of UP households will invest in renewable energy, primarily through shares purchased in the UP Solar Co-op;

5. 500 other small-towns will download the free, ready-to-use tool-kit of templates, replicable best practices, and community case studies from *STEP-UP*. 1% of these towns will use STEP-UP model resources to implement some iteration of their own program in the 3-year duration of the project.

Project Approach

Figure 3: *Sequential Delivery Method for STEP-UP!*



1. Establish Baselines

Credible, quantitative baselines for every element of the STEP-UP program will be established from the very outset, against which to accurately track program impacts and cost-effectiveness. The aggregated baselines will be developed into a simple, reporting "dashboard". The dashboard will serve as a visual tool among the STEP-UP Energy Coach, partners and project management council in their efforts to continually improve the program. 3% of the STEP-UP program budget has been set aside for baseline and EM&V activities, in accordance with industry best practice.

2. Outreach and Community-Based Social Marketing

Outreach will occur through a community-based social marketing campaign that builds awareness, motivates participation among town residents, and drives traffic to the STEP-UP web site. STEP-UP will recruit early participants to become program ambassadors, reaching out to their immediate neighbors to encourage their participation in the program. Efficiency leaders such as Babylon, NY, Cambridge, MA and Smart Power have proven that social marketing works in promoting efficiency – an approach that will be particularly effective in a close-knit community such as University Park. The local channels to be leveraged as part of the STEP-UP social marketing / outreach campaign include:

- Working with the University Park Elementary school and the PTA as STEP-UP outreach partners will be a central part of the program. Activities may include: K-6 energy curriculum, the local Blue Sky Puppets, the rooftop solar array as a learning / science focus, visits from the local Goddard facility, and a school "fundraisers" selling energy efficient products such as CFLs or LEDs (instead of wrapping paper);
- The University Park Solar Co-op, whose rooftop solar arrays provide a visible prompt;
- Both church congregations, one of which will be the first to host a rooftop solar array, will be approached to support *STEP-UP* through congregational participation. A key partner in this activity will be the Greater Washington Interfaith Power and Light;
- Deploying *STEP-UP* materials through the University Park "Welcome Wagon" run by the civic association, and two realtors who manage the majority of town real estate transactions;
- Providing resources to the many local volunteer groups and helping them to identify effective ways to support STEP-UP, including: book clubs, church youth groups, brownies / guides / scouts, and UP sports leagues;
- The University Park town web site, Google group list serve, and other related media;
- The University Park town newsletter (monthly) and local Gazette (weekly);
- Having a *STEP-UP* display and outreach materials available at the many University Park community functions.

Building a dynamic STEP-UP web site will be central to the success of the program. The site will contain all program information on services, incentives, partners, key dates and milestones as well as public recognition of UP energy leaders. The web site will be support social networking tools such as Twitter, Facebook, MySpace, UTube, mobile marketing, blogs, and broadband media.

Finally, *STEP-UP* will provide program participation incentives, encourage friendly competitions, issue challenges, and publicly acknowledge leading residents who meet energy efficiency milestones. The comparative power of seeing one's utility bill benchmarked against that of a "typical" neighbor will take place through partnerships with OPower (bill confidentiality assured), and by distributing a free Google Power Meter to all STEP-UP participants.

3. Leverage Partnerships and Incentives

Figure 2 in the preceding section identifies the partners, services and resources that are to be leveraged as part of STEP-UP. This leveraging is an essential cost-containment tool for small towns, and is necessary for effective program delivery. Examples of leveraging will be key to STEP-UP replication in other small towns.

4. Facilitate Implementation

The STEP-UP Energy Coach will work with each UP resident to implement measureable energy reduction activities in their home. Support will be provided at every step – education, contracting, financing and follow-up. Davis-Bacon prevailing wage rates will be confirmed prior to engaging any sub-contractors or personnel on the project (see Attachments). The main areas of STEP-UP facilitation will include:

a) *PEPCO home assessment and direct install program*: PEPCO's existing program can be immediately deployed at scale in University Park, with *STEP-UP* providing the outreach, pairing the audits with energy coaching for the homeowner, verifying direct install measures, and providing participation incentives.

b) *Maryland Home Performance with ENERGY STAR program* (being delivered in partnership with MEA and PEPCO): STEP-UP will play a major facilitative role in support of this turnkey service, educating UP residents about the pre-screened contractors, supporting the audit process, organizing bulk-purchasing of ENERGY STAR products, and most importantly, providing access to below market financing through a revolving loan fund to defray the up-front cost of retrofits. Home Performance with ENERGY STAR audit / retrofit measures include the following systems:
    a. Air-Sealing
    b. Attic, wall and crawl space insulation
    c. Duct seal or replacement
    d. Windows
    e. Furnace
    f. Air-conditioner or Heat-Pump
    g. Water Heater
    h. Efficient lighting and programmable thermostat

    In addition, STEP-UP will offer UP residents:
    i. Smart Grid connection through PEPCO;
    j. Cool roof application, which can save a further 20% in home energy reduction.

c) *PEPCO ENERGY STAR product rebate program, Federal Tax Credit, MEA state incentives*: STEP-UP will serve as a one-stop-shop for UP residents regarding the wide range of federal, state and utility clean energy incentives available to Maryland homeowners. Renewable energy and energy efficiency subsidies will be part of the STEP-UP clearinghouse.

d) *Bulk purchase program*: In support of the ENERGY STAR product rebates, STEP-UP will facilitate the bulk ordering of ENERGY STAR products by aggregating demand from participating UP residents. The intent is to drive prices lower through bulk ordering, and to repeat this periodically in support of Home Performance with ENERGY STAR activities. The Alliance to Save Energy will support the bulk purchasing efforts through engagement of their Associate partners.

e) *Solar Co-op investment match*: UP will provide an investment match, up to a certain ceiling, for town residents who purchase shares in the local Solar Co-op. The intention is to begin *STEP-UP* through an existing, visible community platform in the solar arrays. The resulting town co-op shares will provide a sustainable revenue stream well beyond the end of the program period.

f) *Streetlighting retrofit with PEPCO*: The UP streetlight serve as a "visible" program element that can be deployed quickly and that demonstrated leadership by example on behalf of the Town. The resulting replacement program will form one of the replicable templates for *STEP-UP*.

g) Community transportation alternatives: UP already runs a commuter shuttle bus to the local metro station and has been active in extending local bus routes in the surrounding communities. STEP-UP will continue to expand the frequency and options of the local public transit. In addition, STEP-UP will encourage UP residents to participate in the Alliance to Save Energy's *Drive $marter Challenge*.

h) *Community Composting program*: A composting program in UP to avoid landfill methane is a natural extension of UP's recycling program that includes mixed paper, glass, aluminum, plastic, steel cans, and leaves. STEP-UP will facilitate homeowner education, bulk purchase and distribution of rat-proof backyard composters.

5. Measure Impacts

On behalf of STEP-UP, the Alliance to Save Energy will engage a qualified professional firm to perform EM&V in accordance with the International Performance Measurement and Verification Protocol (IPMVP), which is the most widely respected protocol for EM&V of energy savings projects, and the Model Energy Efficiency Program Impact Evaluation Guide of the National Action Plan for Energy Efficiency (NAPEE). The EM&V practitioners will be engaged early in program and project design so that an EM&V plan and necessary baselines for estimating energy and cost savings can be established.

All assumptions and methodologies will be clearly stated, including those for determining stipulated or deemed savings of measures, net-to-gross savings ratios (i.e., accounting for free rider and spillover effects), persistence and lifetimes of energy savings measures, adjustments for seasonality and weather, and other parameters. The EM&V plan will address required levels of rigor and uncertainty, and will estimate the following, at a minimum:

- Energy savings and demand reduction by measure, sector, and end-use: lighting, space heating, space cooling, refrigeration, water heating, etc.;
- Cost savings and impacts considering labor, maintenance, replacement, and non-energy utilities;
- Carbon dioxide emissions avoidance;
- Other emissions avoidance, such as for sulfur dioxide and nitrogen oxides; and
- As warranted, impacts on water consumption such as water use and cost savings.

6. Market Transformation

University Park is committed to increasing program impact by catalyzing market transformation within other small towns. Working in partnership with the Alliance to Save Energy, STEP-UP will create ready-to-use templates, model documents, and case studies of lessons learned and best practices designed specifically for replication by other small, resource-constrained towns. The model programs to be followed in this task is the *Energy Efficiency Guide Book for Public Power Communities*, a comprehensive and practical "how to" guide developed by the Center for Wisconsin Strategy, and the *Rapid Deployment Energy Efficiency Toolkit* (RDEE) of the EPA. The STEP-UP web site will host the materials, which will also be actively promoted through the distribution channels in the Table below.

Figure 4: *STEP-UP Program Distribution*

Distribution Partners	Distribution Opportunities
Department of Energy	"Solutions Center" and ENERGY STAR web site
ARRA technical assistance solicitation applicants • Alliance to Save Energy • NASEO • Regional EE Groups (MWEA, NEEP, etc.) • ACEEE • Institute for Sustainable Cities	Web site postings, webinars, events, weekly newsletters. A good model has been established for this sort of outreach through the EPA-supported Clean and Efficient Energy Program for Public Power (CEEP)
National League of Cities	Web outreach, Nation's Cities Weekly
Clean Energy States Alliance	CESA Best Practice briefing papers
US Conference of Mayors	Mayor's blog, webcasts, weekly paper, events
Clinton Climate Initiative	On-line Millennium network forum
ICLEI – Local Governments for Sustainability	Website's Action Center, ICLEI e-News, newsletter
Green for All	Communities of Practice webinars
US Green Building Council (USGBC)	Quarterly newsletters, events, local chapters
Center for American Progress	Weekly e-Newsletter and RSS feeds
US Chamber of Commerce	Institute for 21st Century Energy outreach
Enterprise Community Partners	Green Communities monthly e-newsletter
Urban Sustainability Directors Network	Webinars, conference calls, shared web portal
SustainLane	Best practices website

7. Sustainable Program

The STEP-UP model will only prove successful if it can be sustained beyond the funded grant period (see Project Financing section on following pages for fiscal sustainability). STEP-UP includes several elements that encourage sustained retrofit uptake and low energy use beyond the life of the program, including:

Lasting Community Infrastructure: By increasing the energy literacy of the entire community, STEP-UP will pave the way for future investments in leading clean energy applications, including: participation in the carbon market, home labeling, PACE-type financing, wind farm or biomass applications, and electric plug in hybrid vehicles. Through the success of STEP-UP, the UP Town Council may likewise consider adopting new progressive energy policies, such as energy-related ordinances for new construction and energy-related ordinances for point of sale.

Comparative Bill Analysis: Work with OPower (formerly Positive Energies), STEP-UP will provide comparative bill analysis for participants in UP. Using data analysis and energy consumption comparisons, OPower will compile customer data (confidentiality assured) benchmarked against the consumption patterns of an "average" UP resident in a similar house. Comparative approaches have sustained energy savings rates approaching 5%.

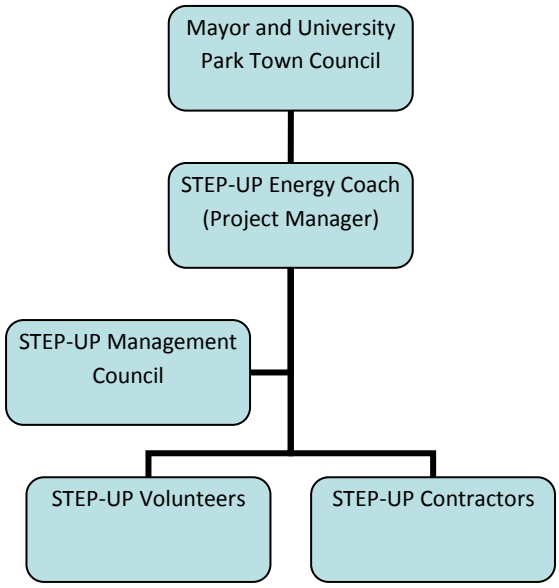
Carbon Offsets: Carbon offsets can provide a positive, tangible reward to ensure ongoing home energy management by STEP-UP participants. STEP-UP will partner with My EmissionsExchange.com, making use of their simple system in which website users only need to input limited utility bill information. As users maintain their reduced energy usage against their pre-retrofit baseline, the reductions are verified

by MyEmissionsExchange and certified as "personal carbon credits." These credits are then sold on the voluntary market to large companies looking to demonstrate their environmental commitment. Profits are deposited directly into MyEmissionsExchange.com users' accounts to be spent any way they like. Once again, this provides a direct incentive for clients to sustain low energy use.

Bulk Power Purchase Agreement: STEP-UP will enter negotiations with PEPCO to facilitate a collective bulk power purchase agreement only for UP residents who have undertaken a retrofit as part of the STEP-UP program. Residents who maintain reduced energy bills will be eligible to join the aggregated power purchase pool at lower power rates based on bulk tariffs. If clients abandon their energy saving ways and their power consumption shows an upward trend, after reaching a threshold and failure of remedial intervention, they will be removed from the pool. This provides a direct incentive for clients to sustain low energy use.

Partnership Structure

A simple, accountable structure will be put in place to manage the STEP-UP activities and partners. The STEP-UP Energy Coach will manage the daily operations of the program and be accountable directly to Council. S/he will be supported by a STEP-UP Management Council consisting of PI Charles Wilson of the Alliance to Save Energy, several leading University Park residents (see attachments), as well as representatives from the partner utilities, financial institutions, and main contractors. The Management Council will use the project tracking baseline to ensure continuous improvement of the project. In addition, the Alliance will serve as a resource on impacts of state and federal codes and standards and other policy impacts (such as the pending Homestar program and ASHRAE home rating system).



Project Financing

University Park seeks $1, 425,000 in three-year funding from DOE, per the detailed line-item budget found in the Attachments to this proposal. In keeping with the agenda of the Recovery Act, University Park affirms that all Recovery Act project funding will be obligated/committed within 18 months from the effective date of the award. The STEP-UP finance mechanisms and leveraging achieve a leveraging ratio of 4.5:1, no including carbon offsets, peak reward programs, and volunteer hours, per Figure 6:

Figure 6: *Sustainable STEP-UP Financing*

STEP-UP Financing Element	DOE Amount	Financial Leverage Source	Leveraged Amount
Revolving loan fund	$135,000	Homeowner equity	$1,350,000
Solar co-op share purchase	$250,000	Resident share purchase	$350,000
Direct participation incentives	$70,000	PEPCO, MEA, federal incentives	$322,000
		Carbon offsets / peak reduction	TBD
		Volunteer hours	TBD

Project Work Plan

Each step towards community energy transformation will be built upon the foundation established in the previous stage, beginning with tasks that are visible, simple and quick to deploy. The sequencing of STEP-UP is necessary to make the program manageable, and allows multiple opportunities for residents to opt-in to the program.

Figure 5: *STEP-UP Program Sequencing and Milestones*

***STEP-UP*! Sequence and Milestones**	**Year 1**				**Year 2**				**Year 3**			
	Q1	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Initial STEP-UP Tasks												
Engage STEP-UP partners; hire Energy Coach												
Develop project web-site												
Create and revise outreach materials												
Establish incentives and application processes												
Establish measurable baselines												
Program outreach / social marketing												
Sequenced STEP-UP Program Activities												
PEPCO assessment and direct install program												
Offer investment match in Solar Co-op												
MEA / PEPCO full HPW ENERGY STAR program												
PEPCO Smart Meter and other utility programs												
PEPCO ENERGY STAR rebate program												
STEP-UP ENERGY STAR bulk purchase program												
Streetlighting retrofit with PEPCO												
Community composting program												
Community transportation alternatives												
STEP-UP Measurement and Sustainability												
Build sustainable infrastructure and revenues												
Evaluation, measurement, verification												
Documenting and road mapping												
Dissemination of template materials												
Ongoing town investment in clean energy												