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List of Acronyms

COP	Chief of Party
COR	Contracting Officer's Representative
DANIDA	Danish International Development Agency
DCOP	Deputy Chief of Party
DOC	Department of Construction
DOIT	Department of Industry and Trade
DPO	Detailed Project Outline
ECC	Energy Conservation Center
EE	energy efficiency
ERAV	Electricity Regulatory Authority of Vietnam
EVN	VietNam Electricity
FIT	Feed in tariff
FS	Feasibility Study
GAP	Gender Action Plan
GDE	General Directorate of Energy
GST	Gender Sensitivity Training
GVN	Government of Vietnam
HAU	Hanoi Architectural University
HCM	Ho Chi Minh
ICD	International Cooperation Department
IFC	International Finance Corporation
ITA	Institute of Tropical Architecture
JICA	Japan International Cooperation Agency
kFW	Kreditanstalt für Wiederaufbau (Reconstruction Credit Institute), Germany
KOICA	Korea International Cooperation Agency
LOE	Level of effort
M&E	Monitoring and Evaluation
MOC	Ministry of Construction
MOIT	Ministry of Industry and Trade
NREL	National Renewable Energy Laboratory
NUCE	National University of Civil Engineering (Hanoi)
PMP	Performance Monitoring Plan
RE	Renewable energy
RfP	Request for proposals
SNV	Stichting Nederlandse Vrijwilligers (Netherlands Development Organization)
SOW	Scope of work
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
USG	United States Government
USTDA	United States Trade and Development Association
VACEE	Viet Nam Association of Civil Engineering for the Environment
VEEBC	Vietnam Energy Efficiency Building Code
VGBC	Vietnam Green Buildings Council
VCCI	Vietnam Chamber of Commerce and Industry
VNCC	Vietnamese Association for Construction
VIAr	Vietnamese Institute of Architects
VISRAE	Vietnamese Institute of Refrigeration and Air-Conditioning Engineers
WB	World Bank

Executive Summary

The second year of implementation of the Vietnam Clean Energy Program focused, first and foremost, on getting the Program formally approved by the Vietnamese government. Winrock was instructed by USAID in November 2013 to stop working on renewable energy (Component 3), shift from the Ministry of Industry and Trade (MOIT) to the Ministry of Construction (MOC) as the Program's main counterpart ministry, and develop a new detailed project outline (DPO) based on a narrower scope. After several months of back and forth and relationship-building with the MOC, the Program was finally approved in March 2014.

Following Program approval and with the entry of a new Chief of Party in April 2014, the Program focused on planning activities reflecting a revised, narrower scope (focusing on building energy efficiency) for the remainder of the fiscal year and the life of the project.

In the last 6 months of Year 2 (April-September 2014), the Program went into full activity planning and implementation mode, with a narrower focus on building energy efficiency but with the same broad objective of strengthening the foundation for low emissions energy systems in Vietnam through the reduction of greenhouse gas emissions and energy use and promotion of public and private investment in clean technologies.

The Project team has focused, worked hard and has been able to generate several important technical products in 4 key areas:

1. Develop a national Building Energy Data National Baseline
2. Develop information and policy recommendations on Green Building Certification Systems
3. Provide Technical Assistance to identify 40% energy savings for a Demonstration Building
4. Develop a comprehensive Training program and deliver 1st two days of training

A significant accomplishment during Year 2 was the development and implementation of an ambitious capacity building program via a series of seminars on technical, policy and financing issues to improve investment in very energy efficient, green buildings with very low GHG output. Early seminars and webinars include *How to Develop and Certify Green Buildings*, integrated design for energy efficient, green buildings, energy simulation techniques. Several hundred people have already received training even as the training program is just ramping up for activities through the fall of 2017, representing 55% of Year 2 targets.

The Program also started working on identifying a Net Zero Energy Green Building¹ as a demonstration project. This demonstration building would produce extremely low levels of GHG as an example of green growth in the Vietnam building sector. With the help of the Ministry of Construction, the Program has been meeting with developers and investors in several cities throughout Vietnam.

To lay the groundwork for increased engagement by the private sector, the Program has been developing several public-private partnerships with local private sector banks, building developers and owners, and has been working with several key organizations such as VCCI. The Program has also been identifying potential funding sources for green buildings that would require compliance with the Vietnam energy code and with a green building certification system recognized by MOC.

¹ This is defined as a building that would sometimes take electricity from the grid, and other times would give electricity back to the grid, so that it over a few years' time its energy use would be a net of zero.

The Program has likewise been providing energy efficiency (EE) policy and technical assistance to the Ministry of Construction on Green Building rating systems. This has included preparing a report that reviews and compares seven regional and international green building certification systems and provides policy recommendations in the Vietnamese context. The findings of this report were shared and discussed in a workshop. Assistance was also provided to three other institutions, namely the ITA, ECC Hanoi and VACEE, representing 20% of the Program's Year 2 target of institutions with an improved capacity to address clean energy issues as a result of USG assistance.

Another milestone in Year 2 was the initiation of efforts to collect building energy data in five large cities, and designing a process to develop a statistically valid national database of building energy performance. These efforts feed into the broader Program goal of enhancing national and local capacity to collect and manage energy data by developing a comprehensive database on building energy performance, which will be used in decision-making, for trainings, and for simulation purposes. This effort has involved face to face initial meetings with Departments of Construction in 5 cities followed by regular web-based meetings to encourage information sharing as well as train and empower local counterparts.

The Program has been actively coordinating its training and demonstration building programs with other donors such as the USDOE energy lab consortium, IFC, Danida, UNDP, KOICA and JICA.

Quantitatively, the Program met 3 targets, far exceeding 2 of them. It also nearly met the training target. The targets exceeded, met, or almost met include:

- Number of policies, strategies, plans, or regulations addressing clean energy officially proposed, adopted, or revised as a result of USG assistance (100%), including refinement of the MOC policy on the Vietnam Energy Efficiency Building Code and input on the MOC policy on Green Building Rating Systems.
- Proportion of female participants in USG-assisted programs designed to increase access to productive economic resources (assets, credit, income, or employment) (124%)
- Number of people with improved awareness of clean energy through accessing energy efficient and green building tools, technologies, and documents promoted by the project (3,153%)

The Program fell short on three Year 2 targets. Due to the long 18 month delay in Program approval, implementation of substantive activities effectively only started in April 2014. This translates into just 6 months of effective activity in Year 2, instead of a full year. Winrock fully expects to make up for the unmet targets in the succeeding years of the Program.

Table 1 presents a summary of the quantitative accomplishments of the Program for Year 2.

Table 1. Vietnam Clean Energy Program Quantitative Accomplishments

#	USAID Code	Indicator	Unit	LOP target	Y2 target	Y2 Actual
		Standard indicators				
1	4.8-7	Greenhouse gas emissions, estimated in metric tons of carbon dioxide equivalent (CO ₂ e), reduced and/or avoided as a result of USG assistance	ton	30,500	0	0
2	4.8.2-14	Number of institutions with an improved capacity to address clean energy issues as a result of USG assistance.		47	15	3
3	4.8.2-6	Number of people receiving training in clean energy as a result of USG assistance	person	5,100	571	479
4	4.8.2-10	Amount of investment leveraged in US dollars, from private and public sources, for clean energy as a result of USG assistance	mil USD	15	0	0
5	4.8.2-31	Expected lifetime energy saving from energy efficiency or energy conservation as a result of USG assistance	kWh	45,000,000	300,000	0
6	4.8.2-28	Number of policies, strategies, plans, or regulations addressing clean energy officially proposed, adopted or revised as a result of USG assistance		11	2	2
7	GNDR-2	Proportion of female participants in USG-assisted programs designed to increase access to productive economic resources (assets, credit, income or employment)	%	25%	25%	30.9
		Customized indicators				
8	VCEP-1	Number of female champions in the field of energy efficient and green building promoted	person	20	2	0
9	VCEP-2	Number of people with improved awareness of clean energy through accessing energy efficient and green building tools, technologies, and documents promoted by the project	person	10,000	500	15,763

Program Description

The USAID Vietnam Clean Energy Program (the Program) is a five-year effort (October 2012 – October 2017) to accelerate Vietnam's transition to climate resilient, low emission sustainable development. The Program focuses on three specific areas²:

1. **Component 1 (Sub IR-2.1)** To enhance the Government of Vietnam's capacity to acquire, manage, analyze and use energy sector data in decision making
2. **Component 2 (Sub-IR 2.2)** Increase energy efficiency in high energy use sectors
3. **Component 3 (Sub-IR 2.3)** Increase public and private investment in and piloting of renewable energy technologies.

The Program is USAID Vietnam's core bilateral program to strengthen the foundation for low emissions energy systems. To complement the Program, USAID/Vietnam coordinates technical assistance activities of the U.S. Department of Energy National Labs Consortium (DOE Labs) and regional USAID programs.

The Program supports clean energy development (i.e., increased use of renewable energy technologies and energy efficiency practices in the building sector) and falls under the general umbrella of the U.S. Government's Enhancing Capacity for Low Emission Development Strategies (EC-LEDS) effort by building Vietnamese capacity in energy data collection, management, simulation, and analysis for policy making in the building sector. The Program targets the building sector to abate greenhouse gas emissions and promote increased public and private investment in deployment of clean technologies in the building sector. Where synergistic, the Project also contributes to relevant development objectives of the GVN such as poverty reduction, private sector-led growth, energy security and energy access.

Project startup and approval activities covered an 18-month period. These are described in Annex A to this report.

² On November 21, 2013, USAID sent Winrock a partial stop work order effectively de-scoping Component 3 (Sub IR2.3) (Increase public and private investment in piloting of renewable energy technologies) from the Program.

Administrative Activities and Progress

Project Launch

On Tuesday, May 6 2014, following the project's formal approval in the second quarter of 2014 under the Decree 93 process, the Program held an official launch to celebrate the project approval and to announce the partnership between USAID and the Ministry of Construction. A ceremonial event was held at the Melia Hotel in Hanoi with over 100 people in attendance. The launch ceremony was carefully planned by Winrock staff and included presentations from USAID Senior Deputy Assistance Administrator Jason Foley, USAID/Vietnam Mission Director Joakim Parker, the MOC Vice Minister Architect Phan Thi My Linh, and Winrock's Chief of Party Joseph Deringer. The presentation by Joseph Deringer is included as Annex B to this report.

Project National Director Nguyen Trung Hoa and COP Joseph Deringer also made presentations that described the project objectives, planned activities, and key expected outcomes. Two panel discussion sessions were organized. One included active participation by DOC representatives from five Vietnamese cities (Hanoi, Ho Chi Minh City, Da Nang, Hai Phong, Can Tho). The other included active participation from professional associations and private sector representatives such as building owners, developers, and bankers.

Winrock's Director of Communications and Public Affairs, Megan Davenport, attended the event. Former COP Mark Tribble, now based in Winrock's headquarters in Little Rock, AR, also attended the event to represent Winrock senior management.

Key impacts of this launch were to:

- Present a very positive image of the project to the public and private sector members of the buildings community in Vietnam who attended the event. The project COP Joseph Deringer provided an overview of the project objectives and key proposed activities.
- Involve public and private sector experts in roundtable discussions. Government officials from five major cities made presentations, and building developers and bankers participated in another roundtable.
- Set the stage for subsequent meetings and collaborations with many of the launch attendees. Many meetings and collaborations have occurred in the months following the launch with a wide variety of stakeholders. There has been a high level of interest in the project from both the public and private sectors, and the project office receives routine calls expressing interest in the project.



Joakim Parker (Mission Director, USAID/Vietnam) (left) and Tran Thi My Linh (Vice Minister of Construction) at the ceremony.



Nguyen Trung Hoa (National Project Manager/Director of Department of Science, Technology and Environment) gave a speech at the Program Launch.

Project Work Plan Kickoff Meeting

On June 6th, the project conducted a workplan kickoff meeting (Appendix A). The audience included key stakeholders from the public and private sectors, who expect to be involved with or impacted by project activities moving forward. The Project team made three presentations at the kickoff meeting:

- COP Joe Deringer presented both 4-month and 1-year work plans;
- Han The Phong, Clean Energy Manager, presented the plan for collection building energy performance data in 5 large cities.
- Ha Huang, Training Coordinator, presented an overview of the training plan for the project.



Winrock staff member Phong presenting the plans for building energy data collection.

In response to the proposed workplans, DOC representatives also presented their commitment to actively participate in the project activities, especially in data collection efforts and capacity building activities. There was extensive discussion and feedback by participants about the draft template for collecting detailed building data.

MOC thought this meeting important enough to publish a 20-page article describing this meeting and its presentations in the July 2014 issue of the “Review of Ministry of Construction,” including a detailed presentation of the Project workplan and schedule.



Rosario (Chato) Calderon (USAID Senior Climate Change Advisor) gives a speech at the meeting.



USAID Clean Energy Program Kick-off Meeting



A number of stakeholders listening intently to the presentations at the planning meeting.

Project Staffing

Change in COP

Mark Tribble, Chief of Party for the project, notified USAID on November 21st that due to a family medical issue he would be leaving the project in FY 2014 Q2. He later provided an end date of March 11. Winrock took steps to find a suitable replacement and in November began actively recruiting for the position. Winrock senior management, represented by President Rodney Ferguson, visited Vietnam in January 2014 and reassured USAID of its commitment to securing formal program approval and ensuring continuity after Mr. Tribble's departure.

Winrock proposed Joseph Deringer for the position of COP for the project in February 2014, and this was accepted by USAID. Starting April 1, 2014 Joseph Deringer has led the project from the Hanoi office, first as Acting COP before subsequently being confirmed for the position as COP. His contributions proved to be invaluable, guiding activities with MOC and building strong relationships within the Ministry. Mr. Deringer was formally approved for the COP position at the beginning of July 2014.

COR Transition

In Mid-August 2014, the Vietnam Clean Energy Program Contracting Officer Representative (COR) responsibilities transitioned from Ms. Rosario Calderon to Ms. Terhi Majanen. Several meetings were carried out at the Program office and USAID Vietnam office. The new COR has quickly taken the lead in guidance the Program.

Other Staffing Changes

Additional changes to project staff in Year 2 include:

- Hiring a new full time Project Accountant Ta Thu Tra;
- Hiring technical specialist Tran Thanh Vu in August to assist on the demonstrations and training. Mr Vu holds a master degree from University of Landscape and Architecture in Bordeaux, France and has 10 years' experience in architectural design and building energy;
- Hiring of a Government Liaison Consultant Nguyen Trinh Huong to help with the program approval process
- Hiring Doug Snyder as a short-term consultant as Green Building and Energy Expert from 17 Feb 2014 to 16 July 2014. The time period was extended to 31 December 2014 to enable completing a Green Building Rating System comparison report.

Coordination with Consultants to Other Donor Projects

A number of donors are supporting MOC efforts to improve building energy efficiency and to green buildings. Regular informal monthly meetings have been suggested by the Program COP with consulting counterparts for related donor programs such as Danida, IFC, UNDP/GEF, E4G (Germany), etc. The purpose is to informally communicate about the related donor activities serving MOC, with the intent of improving the coordination and reducing duplication of efforts related to building energy efficiency and development of a green building action plan.

Technical Activities and Progress

Introduction - Year 2 Technical Products Summary

In the last 6 months of Year 2, the Project team has succeeded in generating several important technical products in 4 key areas of Components 1 and 2 including:

1. Developing a national Building Energy Data National Baseline
2. Developing information and policy recommendations on Green Building Certification Systems
3. Providing Technical Assistance to identify 40% energy savings for a Demonstration Building
4. Developing a comprehensive training program and delivering 1st two days of training

Highlights of these Year 2 technical products are discussed below.

Component 1 (Sub-IR 2.1): Enhance Capacity to Acquire, Manage, Analyze and Use Energy Sector Data in Decision Making

In Year 2 the Project accomplished several key activities in Component 1:

1. Successfully organizing an effort to collect building energy data in five large cities and actually beginning to collect building data within 6 months.
2. Designing the process to develop a statistically valid national database of building energy performance and developing both a detailed data template and an RFP to competitively select organizations to collect detailed building data in 3 climate regions.
3. Designed an innovative approach to use a “bottom-up” technique for using the new building data to generate a tool for permitting quick yet detailed analyses of policy options.

More detail is provided below in each of these Task areas.

Task 1.1 Enhance National and/or Local Capacity to Collect and Manage Energy Data

The following activities have been accomplished in Year 2 under Task 1.1.

- a. A needs assessment was completed by Nexant
- b. A design was developed to generate a computer data base to identify the building stock in 5 large cities for the past 10 years.
- c. Contracts were being negotiated with the Departments of Construction (DOCs) in five large cities
- d. Building stock data has begun to be collected in several of those cities.

Building Stock Data Collection in Five (5) Cities

One of the specific objectives of the project is to develop a comprehensive database on building energy performance, which is used for decision-making, for trainings as well as for energy simulation purposes. To do this, it is essential to carry out detailed surveys and collect data on buildings' energy performance.

We classify buildings into 15 categories depending on the buildings' types and sizes. See **Annex C** for a matrix of the categories. For the moment, the project focuses only on buildings with total floor area of from 2,500m² each (within the scope of the Vietnamese Energy Efficiency Building Code – VEBC). However, there is no official statistics on the quantities of those buildings in each citythe “building stock”).

Consultative Meetings with the DOCs in Five (5) Cities

A key first step was to hold Consultative Meetings with Departments of Construction in five cities just mentioned above. - Can Tho, HCMC, Danang, Hai Phong, and Hanoi. Four people from the project team travelled with MOC's Project Coordinator Mr. Nguyen Cong Thinh. This group had morning meetings in late May and early June with the DOC's in the five cities as part of city-level coordination efforts for building energy performance data collection planning and training activities.

Therefore, the first step of the project's database work is to identify the building stock in each city studied. We have been working with the local Departments of Construction (DOC) of 5 cities including Hanoi, Hai Phong, Da Nang, Ho Chi Minh and Can Tho.

The building data needed in this phase is mostly based on construction permits. However, information is very scattered across many different levels of administrative management. In addition, construction documents are in most cases stored in hard copies only, data retrieval and consolidation process requires significant time and effort. Therefore, the local DOCs have respectively assigned their designated business entities to sign contracts with Winrock for data collection.

The work is under way and is planned to achieve in the end of January 2015. We expect that we will be able to identify about 1,500 target buildings in these five cities. We will randomly select about 225-275 buildings for detailed surveys to take place in primarily in Year 3 of the project, in FY2015.



Detailed Building Energy Performance Surveys

In year 2, the project team designed the approach to the detailed survey, which is described in the next few paragraphs. The survey work starts with 5 cities of Vietnam, including Hanoi, Hai Phong, Da Nang, Ho Chi Minh and Can Tho, representing 3 typical climate zones and territories of the country. For the credibility of collected data, surveyed buildings must be statistically representative for each climate zone. Therefore, it is concluded that, for each climate zone, the optimal sample size must contain at least 5 buildings in each of the building categories (at least to 75 buildings/climate zone).

In year 2, the project team also designed the approach to a Request for Proposals (RFP), described in this paragraph. A subcontractor, specialized in building energy, selected by a competitive bidding process, will carry out the survey work. The Request for Proposals (RFP) is ready to be released by the end of October or early November of 2014. The survey work will start in February 2015 after training on building energy audit, and will take 4-6 months to complete.

In year 2, the project team also explored options for developing an online database system, including the development of a detailed set of software performance requirement. The work identified will be accomplished in Years 3 and 4. Once completed, collected data on buildings will serve as inputs for the next phases of developing a Building Energy Performance Database. The project team is studying the possibility to integrate the SEED database management platform (funded by the US DOE) into the future building energy database to be developed for the Vietnamese Ministry of Construction. The project team will be discussing with international experts on this subject during the next study tour in the US (planned for November, 2014).

MOU with Ho Chi Minh city Department of Construction

Ho Chi Minh City is Vietnam's biggest city with a complex administrative structure. In order to facilitate the implementation of the project activities, Winrock, the Project Management Unit (MOC) and the City's Department of Construction have signed a MOU on August 25, 2014. The parties agree to work towards achieving the Project's objectives, in particular:

- To enhance capacity to acquire, manage, analyze, and use energy data in decision making for implementing the Vietnam Building Energy Efficiency Code QCVN 09:2013/BXD (VEEBC) and Green Growth Action Plan for the sector;
- To promote VEEBC and green building technologies through market incentives and energy demand management practices;
- To increase capacity in implementing VEEBC and formulating Green Growth Action Plan for the building sector

There are 13 main activities to be carried-out in the city with the coordination of the DOC. The MOU gives an indicative schedule each of these activities. The first activity (building stock data collection) began late in Year 2 and is underway as this report is written. The other activities are planned to start early next year (FY2015) and to achieve in December 2016.

Web-based meetings on Data Collection Activities

Regular web-based meetings with DOC representatives from Hai Phong, Da Nang, Can Tho, Ho Chi Minh City and Hanoi are carried out to coordinate and collaborate on activities related to the cities. This coordination helps to improve learning between cities by encouraging information sharing and an iterative training process that empowers local counterparts.

Follow-up meeting with the Hanoi Institute of Building Science-Technology and Economics

The project team held a follow-up meeting with the Hanoi Institute of Building Science-Technology and Economics, under the Hanoi DOC, on 25 June 2014. This Hanoi Institute is the city's designated focal point for implementation of this project. The meeting discussed in detail how to address the complexities of building energy performance data collection within the 29 districts of the City of Hanoi.

Also, Nexant submitted a 148 page Draft Final Report on Building Energy Performance Database, based on review comments by the COP on a previous draft.

Sub-Task 1.2: Enhance Capacity for Simulation, Analysis, and Modeling of Low Emission Buildings and Energy Policy Scenarios

A basic approach to this task has been designed and developed in Year 2. The simulation, analysis and modeling activities will build upon the data collection work and results described above in Task 1.1.

The first task that has been identified in Year 2 is to assess what energy modeling processes are currently being used or are in development; identify weaknesses and gaps; and recommend what types of improvements could be made.

The second task identified in Year 2 is to improve and expand Government of Vietnam modeling capabilities in line with the findings of the needs assessment. The principle focus will be on enhancing the ability to model and assess alternative energy policies that impact energy use, emissions and economic development. The task will include the following elements:

- Review processes used to capture and model policy alternatives
- Identify specific alternative model requirements (as well as their compatibility with current and purposed energy data collection) that will be needed in order to assess the impacts of low-emission, demand-side policies for the buildings sector; risk measurement techniques; and their costs and impacts. Alternate models examined will include
 - Top-down models (e.g., LEAP), and
 - Bottom-up models (simulations of individual buildings) like dynamic building energy modeling (BEM) capture these physical properties in great detail, but are typically used to provide "static" snapshots in time of an individual building's energy use.
 - Regional-scale & portfolio-scale building energy modeling is a hybrid approach:
 - It marries the detailed physical modeling capabilities of bottom-up methods with the trending and stock modeling capabilities of top-down methods.
 - Importantly, it can make direct and extensive use of the data for typical buildings in Vietnam generated in Tasks 1.1.2 and 2.1.1.
 - It can be used utility program managers, codes and standards officials, and owners/operators of campuses or other large real estate portfolios.
 - It can be used for forecasting long-term energy use trends and evaluating the impacts of different programmatic or policy scenarios.³

In Year 2 the approach to Task 1.2 was refined to include the possibility of an innovative approach using regional-scale & portfolio-scale building energy modeling. One possible tool is now being developed by DOE and NREL building upon Open Studio and EnergyPlus. Task 1.2 will be accomplished in years 3 – 5.

³ (See presentation by Deringer on this topic at ASHRAE/IBPSA-USA Building Energy Modeling Conference in Atlanta, GA, USA in September 2014.)

Sub-Task 1.3 Support the use of energy data and analysis in decision making

An innovative approach to this task has been developed in Year 2. This task will be accomplished in years 3 to 5. The key innovative feature is the potential use of a regional-scale & portfolio-scale building energy modeling as a hybrid approach. MOC thinks this is a promising approach.

Component 2 (Sub-IR 2.2): Increase energy efficiency in high energy use sectors

Task 2.1 Demonstrate Models of Economically Viable Building Energy Efficiency Projects

The following activities have been accomplished in Year 2 under Task 2.1.

Task 2.1.1 Evaluate incremental costs and energy efficiency potentials associated with buildings that comply with Vietnam's new building code and green buildings with energy efficiency beyond the code.

The purpose of this work stream is to develop information tailored to Vietnam's building sector that will facilitate widespread compliance with the building code by demonstrating the economic viability of constructing code-compliant buildings and of constructing green buildings with energy efficiency levels that go beyond the code.

In the 2nd half of Year 2 the Project held coordination meetings with a number of Vietnamese organizations regarding:

- Creating collaborative networks, and
- Strengthening existing and emerging in-country organizations in the buildings sector.

For example, Project team staff attended a VACEE workshop on energy audits and made an impromptu presentation. Meetings were also held with the:

- Vietnamese Institute of Refrigeration and Air-Conditioning Engineers (VISRAE),
- Hanoi Architecture University's Institute for Tropical Architecture (ITA),
- Vietnamese Institute of Architects (VIAr), and
- Vietnam Green Buildings Council (VGBC).



Meeting with ITA Director

Task 2.1.2 Provide TA to the Development of a Green Growth Action Plan for the Building Sector in Vietnam

Several key activities were accomplished in Year 2 for this task on providing MOC with policy input on Green Building Certification Systems including:

1. Developing a 159 page report, **A Review Of Seven Regional And International Green Building Certification Systems**, that reviewed and compared seven regional and international green building certification systems, as a basis for providing policy recommendations to MOC,
2. Organizing and hosting a 1-day workshop attended by 85 people to discuss green building certification system issues and options for Vietnam,
3. Preparing a 1-hour PowerPoint presentation to summarize the findings of the report, and presenting this at the 1-day workshop.

Development of a Comparative Report on Green Building Rating Systems

The Project team developed a 159 page report, **A Review Of Seven Regional And International Green Building Certification Systems**, that reviewed and compared seven regional and international green building certification systems, as a basis for providing policy recommendations to MOC.

This Green Building Rating System review is evidently successful for the MOC has indicated that it wishes to have the Winrock team provide policy assistance to MOC as it addresses a green building action plan.

Organizing a Workshop on Green Building Rating Systems (GBRS) (Y2Q4)

A full day seminar on Green Building Rating Systems (GBRS) was hosted at Vietnam Institute of Architecture (VIA) on July 23rd 2014. The purpose was to organize a 1-day workshop to discuss green building certification system issues and options for Vietnam.

- There were 3 main presentations - the Project, VACEE, and VGBC.

- 85 people attended the morning session, and over 50 people attended in the afternoon.
- The afternoon included an extensive Q&A session.
- Chato Calderon and Dr. Hoa made opening remarks. Dr. Hoa moderated the morning session, and Mr. Deringer moderated the afternoon session.
- The Program message “Green Building – Green Future” with USAID logo was conveyed to the participants.



The event attracted interest from architects, government officials, private sector representatives, professional organizations, and the media.

Prepared Training Seminars on Green Building Rating Systems (GBRS) (Y2Q4)

Prepared a 1-hour PowerPoint presentation to summarize the findings of the report, and presenting this at the 1-day workshop. This 1-hour presentation was then expanded to a 3-hour presentation that was presented as part of a training series for Green Week.

Task 2.1.5. Carry out Energy Efficiency Building Demonstration Projects

Provide Technical Assistance for a Demonstration Building

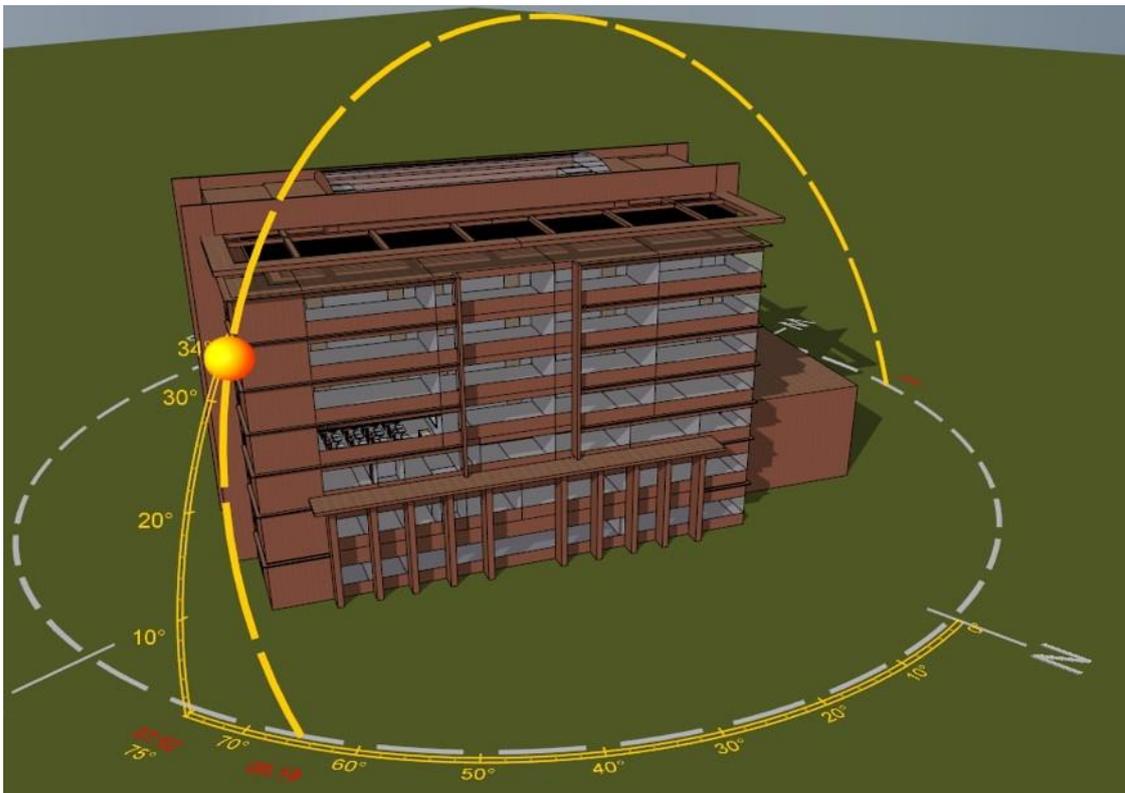
During the end of Year 2, the Program has provided technical assistance to the project manager (ECC Hanoi), the building owner (Hanoi DOIT) and the design team to help them help to refine their design of the Training Center Building, a 7,000 m² energy training center in Hanoi, The Program energy simulation specialist has reviewed the current design for the building and found that it was not compliant with the 2013 Building Code, therefore the Program offered ECC Hanoi to assist them refining their design to achieve better energy performance without increasing the building total investment.

According to estimates to date:

- Changing the building design for this building from the original base case design to comply with the 2013 VEEBC will reduce energy use by 20%.
- Application of additional cost-effective measures would result in a total reduction in energy use of 40% at virtually no increase in first cost.

As of the end of FY2014, the Program is waiting for ECC Hanoi to approve and implement the recommended measures.

An example image from the energy simulation analysis is presented below:



3D sun path diagram of the ETC building showing orientation of major glazed areas.

Sub-Task 2.3: Demonstrate Building Energy Demand Management and End-Use Efficiency Practices and Technologies

Activities for this sub-task did not occur in Year 2, but will occur later in the project.

Task 2.4 Enhance Professional Technical Capacity Related to Energy Efficiency Practices in Buildings

The following activities have been accomplished in Year 2 under Task 2.4.

Task 2.4.1 Compile information on existing training courses related to building energy efficiency and green building design

A report on available training courses related to building energy efficiency and green buildings in major cities in Vietnam, and an evaluation of unmet training needs, was completed at the beginning of Year 2 in October 2013.

Sub-Task 2.4.2 Select partner institutions for training program

The Project has identified the following existing institutions as potential partner institutions for training:

- Hanoi Architecture University's Institute for Tropical Architecture (ITA),
- Vietnamese Institute of Architects (VIAr),
- National University of Civil Engineering (NUCE)

An MOU is currently being developed between the Project and The National University of Civil Engineering. Collaboration will be in the form of stakeholder in training and capacity building activities. It is expected that the MOU will be finalized and signed during the early part of Year 3. Current plans with NUCE call for up to several days of training per month.

Likewise, the Project has developed an MOU with ITA to collaborate in producing Green Week in September of 2014. This was successful and similar collaborations are planned for subsequent years.

Sub-Task 2.4.3 Develop Outline of Training Program

During Year 2 a comprehensive training program was been developed and then extensively refined during the last six months of the fiscal year. The training program supports an overall project objective to transform the building market by producing demonstration buildings that are low energy or net zero energy, and that promote a green growth action plan.

The training program is focusing on some key training areas in support of the market transformation objective, such as:

- Integrated design to produce high performance and/or green buildings,
- Green building design and certification,
- Commissioning of buildings to ensure that planned savings actually happen.

The table below contains a listing of the current topics included in the outline of the training program.

Table 2. Proposed training courses under USAID Vietnam Clean Energy Program

Course Track	Code	Session	Buildings	Key Audiences	Priority
HIGH PERFORMANCE BUILDING DESIGN	HP1	Introduction to HPB design (How to apply low tech solutions for high tech outcomes)	New	MOC, DOCs, Institutes, Consulting agencies, Professionals, investors, building owners, project developers	2
	HP2	Lighting: Daylighting Design, High Performance Fixtures, Controls	New & Existing	MOC, DOCs, Institutes, Consulting agencies, Professionals, investors, building owners, project developers	3
	HP3	Mechanical Systems: Hot Water, Heating, Cooling, Ventilation	New	MOC, DOCs, Institutes, Consulting agencies, Professionals, investors, building owners, project developers	1
	HP4	Solar Power: Building Integrated Photovoltaics (BIPV) and Solar Thermal (Parts 1 & 2)	New & Existing	MOC, DOCs, Institutes, Consulting agencies, Professionals, investors, building owners, project developers	4
	HP5	EE Building Technology and Materials and EE Technology Database (Parts 1 & 2)		MOC, DOCs, professionals, building owners	2
	HP6	Building and Energy Management Systems (BMS/EMS)		MOC, DOCs, ECCs and consulting agencies under MOC & DOCs, professionals, Energy auditors, energy managers	3
	HP7	Lifecycle Analysis (LCA) of Building Systems and Materials	New	Architects, Engineers, Builders, Universities, Project developers, PMUs	2
	HP8	Energy Efficiency Retrofits of Existing Buildings (2 Parts)		MOC, DOCs, Institutes, Consulting agencies, Professionals, investors, building owners, project developers	3
	HP9	Operations and Maintenance (O&M) for Continued Performance	New & Existing	MOC, DOCs, Institutes, Consulting agencies, Professionals, investors, building owners, project developers	3
	HP10	Tenant Improvement - Floor by Floor building renovation	Existing	Professionals (architects, engineers, mechanical engineers..), building owners, tenants, occupants, builders, environmental experts, project managers	1
	HP11	Building Energy Audits	Existing	MOC, DOCs, ECCs and consulting agencies under MOC & DOCs, professionals, Energy auditors, energy managers	2
INTEGRATED DESIGN	ID1	Integrated Design process for Central HVAC system - with examples and simulation results	New	Professionals (architects, engineers, mechanical engineers..), building owners, tenants, occupants, builders, environmental experts, project managers	1
	ID2	Integrated Design process for Split HVAC system	New	Professionals (architects, engineers, mechanical engineers..), building owners, tenants, occupants, builders, environmental experts, project managers	1
	ID3	Integrated Design in building renovation - Whole building	Existing	Professionals (architects, engineers, mechanical engineers..), building owners, tenants, occupants, builders, environmental experts, project managers	2

Table 2. (continued) Proposed training courses under USAID Vietnam Clean Energy Program

Course Track	Code	Session	Buildings	Key Audiences	Priority
GREEN BUILDINGS	GB1	Lifecycle Analysis (LCA) of Building Systems and Materials: Carbon Footprints, Health Hazards, Impacts		Architects, Engineers, Builders, Universities, Project developers, PMUs	3
	GB2	Green Building Rating systems - Options for Vietnam		Architects, Engineers, Builders, Universities, Project developers, PMUs	1
	GB3	Case studies of applying GBRS to buildings in Vietnam			1
	GB4	Efficient Water Management in Buildings (and Communities?)		Architects, Engineers, Builders, Universities, Project developers, PMUs	1
	GB5	Creating Resilient Communities: Building (and Rebuilding) Affordable Projects to Endure the Impact of Climate Change and Extreme Weather Events		Architects, Engineers, Builders, Universities, Project developers, PMUs	2
	GB6	Developing Resilience Action Plans for Cities		Architects, Engineers, Builders, Universities, Project developers, PMUs	3
BUILDING ENERGY SIMULATIONS	BS1	Building Energy Simulations - Introduction and Fundamentals		MOC, DOCs, Professionals (architects, engineers, mechanical engineers..)	1
	BS2	Building Energy Simulations - Applications in Typical buiding designs		MOC, DOCs, Professionals (architects, engineers, mechanical engineers..)	1
	BS3	Building Energy Simulations - Code compliant building model		MOC, DOCs, Professionals (architects, engineers, mechanical engineers..)	1
	BS4	Building Energy Simulations - Green building model		MOC, DOCs, Professionals (architects, engineers, mechanical engineers..)	1
	BS5	Building Energy Simulations - Modeling, Metering and Verification		MOC, DOCs, Professionals (architects, engineers, mechanical engineers..)	3
MARKET DRIVING PRACTICES	MA1	Public and Private Finance and Incentives for EE and Green Building		MOC, DOCs, Construction corporations, Private sector, banks	3
	MA2	Market Driving Public Sector Policies and Private Sector Strategies for EE and Green building		MOC, DOCs, Construction corporations, Private sector, banks	1
	MA3	Costs and Benefits of EE (Life cycle analysis)		MOC, DOCs, Construction corporations, Private sector, banks	1
	MA4	Marketing Green Building: A competitive advantage without Greenwash		MOC, DOCs, Construction corporations, Private sector, banks	1
	MA5	Unleashing the Capital for a more sustainable world		MOC, DOCs, Construction corporations, Private sector, banks	3
	MA6	Transforming Construction Firms for High Performance		MOC, DOCs, Construction corporations, Private sector, banks	3
DATABASE DEVELOPMENT, OPERATION AND MANAGEMENT	DB1	Building Energy Data Collection & Archiving	New & Existing	MOC, DOCs, professionals, building owners	2
	DB2	Comparison of International & Regional Online Building Data Entry Systems - Operation, Features, Application of Vietnam	New & Existing	MOC, DOCs, ECCs and consulting agencies under MOC & DOCs, professionals, Energy auditors, energy managers	2
	DB3	Building Energy Database Analysis & Use and Management	New & Existing	MOC, DOCs, professionals	2
	DB4	Using the online data system to enter data on buildings (overview)	New & Existing		2
	DB5	Using the online data system to enter data on buildings (hands-on training using building examples)	New & Existing		2
	DB6	Hands-on exercises in maintaining the MOC data base of buildings for Vietnam	New & Existing	MOC, DOCs, professionals	2

Since a key objective of the Program is to help transform the market for producing and operating buildings, the key audiences for the training are public and private sector building owners, developers, designers, contractors, and operators, plus equipment and material suppliers, as well as students in technical and professional schools.

During September 23-24, 2014, 12 of seminars were presented for the first time at ITA Green Week. About half of the participants were female.



The training was well attended by the public and private sector



Attendees include developers, designers, contractors, and operators, plus equipment and material suppliers, as well as students in technical and professional schools.



About half of the training participants were female.



VCEP Project Chief-of-Party Joseph Deringer granting certificates to trainees

Planning for a First Study Tour to the United States

The Hanoi-based Project office has been actively planning for the first study tour during the last half of Year 2 of the project.

The Project team completed detailed planning activities for a first study tour of several locations in the US for MOC staff in November 2014. This study tour will present the participants with a balanced introduction to key energy efficiency organizations and activities in the buildings sector across the US, covering a 16-day, 15-night tour.

An expected impact of this first study Tour is to enable the 7 participating key officials within MOC to gain an understanding of the goals, objectives, methods, and staffing of a number of mature and innovative energy efficiency and green building organizations and programs in the US. They will also see several very low energy, high performance and green buildings in each location they visit. The study tour is critical to the VCEP project for the itinerary is intended to raise the level of awareness of the key participating MOC decision makers as a basis for their future actions and policies. VCEP's success will depend not only on the products produced, but also on the ability of MOC decision makers to refine their policies to effectively use the products.

The tour will include visits to most of the following cities and organizations: Department of Energy, General Services Administration, International Code Council, USGBC, Winrock International Home Office in Washington D.C.; key Organizations and high performance, green buildings in Hot, Humid locations in South Eastern US including Austin Power, which has a city online database for building energy, and Texas A&M University (Energy Systems Lab); key DOE research laboratories (Lawrence Berkeley National Lab, Berkeley CA); key utility-based energy training and demonstration centers (PG&E's Pacific Energy Center - San Francisco), key state and city electric and gas utilities (Pacific Gas and Electricity - PG&E); key public utility commissions (California Public Utility Commission - San Francisco).

At MOC's request, the study tour will occur early in Year 3 of the project in November 2014. The draft concept paper for the tour is in Annex E to this report. The draft itinerary for the study tour is included in Annex F. The final list of participants is contained in Annex G.

Organizing a Training Series and a Conference on Green Buildings

In response to the World Green Architecture Week 2014, a series of training courses on green building topics was carried out by the Program in co-operation with the Institute of Tropical Architecture (ITA) under Hanoi Architectural University (HAU) on September 23-24, 2014. The targeted trainees are students and lecturers, researchers among other in the field of architecture and civil engineering. The three courses held at this event include:

- Course 1: Building Energy Simulations (1.5 days),
- Course 2: Integrated design toward High performance buildings and Green Building Rating Systems (1 day), and
- Course 3: Green building in reality (0.5 day).

Trainees are provided with CD-ROM consisted of 5 common building simulation software (EnergyPlus, Simergy, eQuest, Dialux and Relux). The training agenda delivered by the Program for the ITA 2014 Green Week is located in Annex H of this report.

Component 3 (Sub-IR 2.3): Increase Public and Private Investment in and Piloting of Renewable Energy Technologies

During the first part of Year 2, the Program completed the two activities summarized below prior to the cessation of activities on for Component 3.

No other renewable energy activities were carried out after November 2013, when it was de-scoped from the project by USAID. The contract was then again modified in August 2014, and renewable energy was included again in the scope of work within a reduced level within Component 3, but Winrock is still waiting for clear guidance from USAID on what types of activities it wants to be implemented under this component.

Off-Grid Opportunities and Challenges in Vietnam

On January 14, 2014 Winrock in collaboration with SNV submitted to USAID a final report on “Off-Grid Opportunities and Challenges in Vietnam”. The objective of the report is to screen off-grid communities and evaluate renewable energy resources, technologies, and potential sources of funding for electrification. The report was provided to USAID and is available for further action to help increase off-grid electricity access.

Wind Energy Workshop in HCMC

Winrock participated in a Wind Energy Workshop in Ho Chi Minh City on February 20-21, 2014. Organized by the U.S. Consulate and the Ministry of Industry and Trade, the workshop sought to engage Vietnamese government authorities, private developers, and the US Government to discuss opportunities and challenges facing the sector. Three Winrock staff attended, Mark Tribble, Vu Thi Kim Thoa, and Han The Phong, with Mr. Tribble presenting on the international experience in wind power support policies. Rosario Calderon of USAID was also in attendance and presented on the USG development strategy in Vietnam as it relates to wind energy development. The event was attended by the US Consulate General, USAID, USTDA, US Ex-Im Bank, HCM People’s Committee, MOIT and over 20 industrial and private project developers in Vietnam. See Annex I for a complete trip report.

Cross Cutting Activities

Communications

During this reporting period, Communications activities carried out include:

- **Website development:** The Program worked on designing a website to promote activities and facilitate information sharing with key stakeholders. A project website design has been developing with the endorsement of USAID. The Information Centre of Ministry of Construction has been selected to be the project website provider after several project partners and website service companies have been interviewed.
- **Database Development:** The Program started developing a database of organizations working in the building energy efficiency, climate change, and green growth sectors in Vietnam.
- **Communication products:** Printed document bag and Green notebook conveying messages on energy efficient building and green building were produced and used in all of project events. CD-ROMs energy simulation software Media relation has been strengthened and communication databank is growing.
- **Project Launch Event and other communications activities:** All of the project events were organized successfully with support from the communications staff member. Routine support to COP, DCOP and other staff has been carried out daily. Other support has been given to the Program admin team (layout, design, translation), project relations with USAID and other donors, Government partners and other projects/international NGOs.

Gender

With Vietnam's rise from low to middle income status in the past quarter century, women have made many gains in terms of access to education and opportunities for employment. Certain fields of study and sectors, however, remain male-dominated. These include the energy and construction spheres, where the Program currently operates. Technical occupations (e.g. engineers and architects) and positions of leadership are still mostly occupied by men. The Program aims to address some of these gaps by designing and implementing activities that increase women's access to technical training and technical assistance. Gender considerations will also inform program activities related to accessing finance for adoption of energy efficient technologies and equipment and for energy enterprise finance.

No gender-related activities were carried out during the first 6 months of Year 2 as the main focus of the Program was securing formal government approval. In the second half of Year 2, Program staff made an effort to encourage greater participation of women in trainings and in the study tour. With program implementation finally in full-swing, the next step will be to provide staff with gender sensitivity training (GST) in the early part of Year 3 to increase their awareness of gender issues and build their capacity to incorporate gender concerns across Program activities. Program staff will also collectively formulate a gender action plan (GAP) that will guide longer-term activities. The GAP will identify specific gender related issues, propose actions, formulate objectives and identify concrete activities to meet those objectives. Progress in meeting the targets/objectives will be tracked regularly as part of the program's monitoring and evaluation activities.

Environmental Compliance

No activities occurred in Year 2 in this crosscutting area.

Challenges and Proposed Solutions

The Program faced a number of challenges in Year 2, but has been proactive at providing solutions and addressing obstacles as they arise. The biggest challenges stemmed from the prolonged Project approvals process, which required significant expenditures of Program time and money, with few technical deliverables to show for it. Winrock worked collaboratively with USAID to identify the quickest path to project approvals with the Ministry of Construction (MOC), and has been fast to ramp up implementation activities since approvals. Working with the MOC resulted in a change in project scope, which necessitated a contract modification from USAID to more accurately reflect the new project direction. Winrock provided extensive comments to USAID and was very responsive to changes in budget and scope for the Program during the modification process.

Modified GVN Counterpart Budget

Winrock anticipates future challenges working with the Ministry of Construction to implement activities due to conflicting budgetary figures in MOC files and USAID files. At the time when Winrock built a relationship with MOC and submitted official project documents via the Decree 93 process, Winrock had anticipated that our relationship would be a component of a larger EC-LEDS program. This resulted in the development of a \$3 million technical assistance plan that was approved both by the Vietnamese Government and USAID. But with the re-scoping of the project and subsequent modification of the Winrock contract with USAID, the implementation of activities with MOC was greatly expanded from \$3 million to \$8 million over the life of the project.

Winrock believes that MOC will at some point become aware of the discrepancy between the budget that Winrock has shared with them (\$3MM) and the actual Program budget (\$8MM). The concern is that if MOC finds out about the \$5 million difference in the approved budget and actual budget, the perception of secrecy and distrust may hinder collaboration activities.

Winrock recommends that USAID to formally communicate to MOC that life of project funding has been increased from \$3 million to \$8 million. This will engage the partner and will help to ensure counterpart buy-in for planned activities. It will also help to reduce the risk of non-performance or potential unforeseen changes to project scope due to requested changes from MOC. Winrock would take the lead in working with MOC to update the DPO via the Decree 93 process if necessary.

Unclear Component 3 (Renewable Energy) Scope

When revising the budget and scope of work for the contract modification, USAID left a large role for the technical implementation of Component 3, Renewable Energy. Winrock welcomes the challenge of helping to expand energy access and pilot RE technologies in Vietnam, but is concerned that the scope of Component 3 in the contract does not match the planned activities in the recent USAID approved work plans.

As of this report, Winrock has allocated \$1 million LOP for the implementation of Component 3, with the suggested (but not approved) implementation activities of:

- Renewable energy activities with Vietnam Committee for Ethnic Minority Affairs (CEMA) in the Thanh Hoa province to support their green growth strategy.
- VCEP would have the resources to spend \$50,000/activity in Thanh Hoa province, if appropriate, to enable a RE investment proposal to be viable.

Winrock would like to request clear USAID guidance to develop an actionable work plan that will enable Winrock to meet the contractual requirements for this component.

Resource Constraints for “Follow-On” Work

Winrock spent much of FY2014 ramping up as quickly as possible once project approval occurred. This included implementation activities such as trainings, building analyses, and data collection and management. This has required additional staff, consultants, and increased resources across the board to help meet the demand from MOC and other counterparts.

The need for a modern and enforceable building energy performance system in Vietnam is great, as are the needs for improved and coordinated building energy data and database management systems. With no shortage of opportunities, Winrock can envision an expanded program that engages additional stakeholders, provides depth in training and capacity building activities, and helps to create an enabling environment for meaningful private sector engagement in the energy efficient building sector.

Winrock will work within the bounds of our current budget, but additional increases in funding can help to open up new doors, better enable Winrock to train GVN counterparts, and allow USAID to reap myriad additional successes in country.

Lessons Learned To Date

Year 2 posed a number of challenges to the Program that required a major shifting of gears and significant rechanneling of resources and efforts. Below are some of the lessons learned during this reporting period.

Regular coordination with other donors is essential to maintaining the relevance of the program and ensuring there is no duplication of work. There are numerous programs in Vietnam sponsored by other donors in the clean energy and energy efficiency space. Programs by DANIDA, WB/IFC, KOICA, UNDP, JICA, USDOE energy lab consortium, and others are very active in country and are coordinating activities such as policy reform, counterpart training, and demonstration activities that are relevant and potentially complementary to VCEP activities. In order to maximize assistance to GVN recipients, Winrock has actively engaged other donors and regularly coordinated activities for training and demonstration programs to help minimize duplication of efforts and to leverage activities where appropriate.

The Program is working with DANIDA to develop a shared database and methodology for monitoring energy efficiency code compliance nationwide, as well as working with WB/IFC to advise on a Vietnam building energy efficiency code demonstration activity. The Program is also currently engaging with KOICA to potentially assist with the design and technical review of an energy efficient building.

Active private sector engagement will help ensure long-term sustainability. Building the capacity and increasing awareness of the local private sector is critical to achieving USAID and GVN goals and ensuring sustained Program results. Our early interactions with developers have confirmed that they need training on industry best practices and assistance in developing bankable projects that banks will finance. The Program has started developing several public-private partnerships with local private sector banks, building developers and owners, and has been working with several key organizations such as VCCI. The Program is also identifying funding sources for green buildings that would require compliance with the Vietnam energy code and with a green building certification system recognized by MOC. Additionally, Program is engaging private sector coalitions and industry groups such as the Vietnam Green Building Council to build industry consensus around practices that will help create additional certainties for investors.

Demonstration Buildings are effective vehicles for market transformation so long as technical assistance begins early. Experience to date with demonstration buildings in Vietnam and elsewhere indicates that substantial energy savings are achievable cost-effectively. Some 30% to 50% energy savings are achievable. Furthermore, the resulting buildings speak for themselves as examples of successful results. Thus, a high priority can be placed upon identifying additional demonstration buildings and providing technical assistance.

However, it is very important to provide technical assistance early in the building design and delivery process everyone before key design decisions have been made. After such decisions are made it becomes increasingly expensive to go back and change a design the has already been well-developed, Also, the building designers and developers may have become committed to the design under development and may be reluctant to accept new design solutions even if the new solutions are far more energy efficient or sustainable.

Other lessons learned about demonstration buildings so far include:

- The apparent lack of serious attempt to comply with the requirements of the 2013 energy code. Only lip service was given to code compliance. We identified 20% energy savings from

the original building design, just by complying with the prescriptive requirements of the energy code.

- A serious lack of understanding by the design team of basic energy efficient design practices. This is a serious problem and must be overcome if widespread and substantial energy savings are to be achieved.
- Providing free technical assistance for demonstration buildings can incur costs on the Program, in terms of staff time and consultant time. Just consultant costs for technical assistance for a high performance building might run \$20,000. Consultant costs for a high performance green building might run \$40,000, including green building certification.

The ownership of code compliance documentation can be quite complex. This is especially the case in larger cities such as Hanoi or Ho Chi Minh. For example, there are over 30 potential government entities in Hanoi who are potential owners of building code compliance documentation and occupancy permits for buildings. This will present challenges when designing and developing online data entry systems to track information about current and future buildings.

Government requirement of Green Building Certifications for public buildings is a Powerful Force. This has been the case in other countries. It could be a strong policy incentive in Vietnam. Current policy options in Vietnam are complicated because of competition between two Vietnamese Green Building Rating Systems:

1. The LOTUS system developed by NGO VGBC.
2. A Building Green Rating System by VACEE, an Institute under MOC.

The LOTUS system has been extensively reviewed and vetted by the building industry in Vietnam. The VACEE system has not received widespread review, and is likely 3 years from completion of such review. It would be desirable for MOC to establish policy without waiting such a long time. This complexity has been a major “lessons learned” in this arena of the project.

Monitoring and Evaluation

Below is a summary of the indicators from the provisionally approved PMP (now M&E) from January 2013, as modified during the 3rd quarter. At the end of the 3rd quarter, several activities had been undertaken to directly contribute to the M&E.

Indicator	Description	FY 2013-2014 Accomplishments	Remarks
4.8-7	Quantity of greenhouse gas emissions, measured in metric tons of carbon dioxide equivalent (CO ₂ e) reduced or sequestered as a result of USG Assistance	0	
4.8.2-14	Number of institutions with an improved capacity to address clean energy issues as a result of USG assistance	3	ITA, ECC Hanoi, VACEE
4.8.2-6	Number of Persons receiving training in clean energy as a result of USG assistance	479	GB seminar and GB week trainings
4.8.2-10	Amount of investment leveraged, in US dollars, from private and public sources for energy efficiency projects as a result of USG assistance	0	
4.8.2-31	Expected lifetime energy saving from energy efficiency or energy conservation as a result of USG assistance	0	
4.8.2-28	Policies – number of policies, strategies, plans or regulations. Number of policies, strategies, plans or regulations addressing clean energy officially proposed, adopted or revised as a result of USG assistance	2	
GNDR-2	Proportion of female participants in USG-assisted programs designed to increase access to productive economic resources (assets, credit, income or employment)	30.9%	Average from all training events. Last training event was close to 50%
VCEP-1	Number of female champions in the fields of energy efficient buildings, green buildings, and renewable energy promoted	0	
VCEP-2	Number of people having clean energy awareness improved by accessing tools, technologies, and documents on energy efficient buildings, green buildings, and renewable energy promoted by the project	15,763	Including trainees, people accessed to the program training or communications materials

Financial Information (FY 2013-2014)

Ongoing

Plans for FY 2014-2015

Component 1 (Sub-IR 2.1): Enhance capacity to acquire, manage, analyze and use energy sector data in decision making

Specific activities described below will be approved throughout the Year 3 Work Plan.

Building Energy Performance Detailed Surveys

During the 1st and 2nd quarters of year 3 (2015), the Project plans to carry out detailed surveys of more than 200 buildings throughout Vietnam.

Winrock will provide subcontractors with the results of the “*Building Stock Data Collection*” work, which is being carried out with the coordination of provincial Departments of Construction (DOC). Based on the Building Stock data that is collected and other available information, subcontractors will use approved random sampling technique to identify a proposed “Sample Set” of buildings to be surveyed for each category.

After Winrock’s consideration and approval of the said Sample set, subcontractors will carry out actual detailed surveys of buildings identified in the set. Subcontractors will need to verify actual construction status of the buildings before surveying, and also need to send technical staff to participate in a training session on building energy audit, which will be organized by Winrock by the end of December 2014.

All data collected during the surveys will be entered into a database, ready for use by Winrock’s experts for the development of the Building Energy Performance Database.

Develop Detailed Specifications for the *Building Energy Performance Database’s* Online Data Entry Interface

The Program team plans to begin to work with Nexant, MOC and local DOCs to develop detailed functional requirements for the planned online data entry system. In a first stage effort, this data entry system will be used by the DOCs in the five major Vietnamese cities. It is anticipated that all 63 DOCs throughout Vietnam will eventually use this online data entry system.

Web-based Meetings on Data Collection

The Program team plans to hold regular online meetings with DOC representatives, using the GoToMeeting platform.

Trainings and Workshops on Building Energy Data Collection, Management and Use

The Program team plans to work with EnerTEAM and other stakeholders including MOC, local DOCs and ECCs to carry out a series of trainings and workshops relating to building energy database management.

Data Collection Activities with MOC, with the DOCs in Five Cities, and with the Energy Conservation Centers (ECCs) in Hanoi and HCMC

During the 4th quarter of year 2, the Project has developed contracts or entered into contracts for collecting data on the building stock in the five cities. Data began to be collected in a few cities prior to the end of year 2. This is anticipated to produce data about the number of buildings larger than 2500 m² that have been constructed in the five cities over the past five to ten years.

Based upon the results of the Building Stock data collection, the Project will work with MOC, the 5 DOCs, the 2 ECCs, and others as appropriate to:

- Refine the detailed building data template
- Select a statistically valid set of buildings for each cell, considering climate, building type, and building size, within the limits of available funding.
- Put contracts in place for the detailed data collection effort.
- Begin to collect detailed data for the selected buildings.

Web-based meetings on Data Collection Activities

The Program team plans to continue the series of web-based meetings, using the GoToMeeting software, with DOC representatives from the involved cities in order to enhance the consistency of the data collection activities across the involved cities.

Develop Performance Specifications for the Planned Online Data Entry Software Capability

The Program team plans to begin to work with Nexant, MOC, the DOCs, and the ECCs to develop detailed functional requirements for the planned online data entry system. It is anticipated that all 63 DOCs throughout Vietnam will eventually use this online data entry system.

Begin to Develop Data Management Capacity-Building Needs and Training

The Program team plans to begin to work with Nexant, MOC, the DOCs, and the ECCs to begin to develop a data management capacity building plan with associated training elements.

Component 2 (Sub-IR 2.2): Increase energy efficiency in high energy use sectors

Promote the transformation of the buildings market via Green Growth

The USAID Vietnam Clean Energy Program has been conducting activities to promote a transform the buildings market in Vietnam by demonstrating the benefits of increased investments in buildings that can reduce energy use and GHG generation by 30% to 50% from current practice. Such buildings would only increase first costs by 3-5% and provide a payback on investment within 3 to 5 years.

The Project office has been providing EE and RE technical and policy assistance to the Ministry of Construction on Green Building rating systems. This will include developing a seminar in late July that that will permit the comparison of key Green Building systems.

Related RE efforts include the conceptual development, in potential collaboration with KOICA, of a demonstration of a Photovoltaic-assisted fish cold storage facility along the coast of Vietnam.

Develop Demonstration Building Projects, including Collaboration with KOICA

As an example of the core Green Growth Action Plan development of the USAID Vietnam Clean Energy Program, the project team is working in partnership with KOICA to produce a potentially Net Zero Energy Green Building as part of a new Vietnam-Korean Science and Technology Institute (V-KIST). The goal is to produce a building that would sometimes take electricity from the grid, and other times would give electricity back to the grid, so that it over a year's time its energy use would be a net of zero. This potential demonstration building in collaboration with KOICA would produce extremely low levels of GHG as an example of green growth in the Vietnam building sector.

The Program has been actively seeking and identifying other potential demonstration buildings and their developers and investors in several cities throughout Vietnam (Danang, Can Tho, etc.).

Develop Public-Private Partnerships

The Program has been developing several public-private partnerships with local private sector banks, building developers and owners, and has been working with several key organizations such as VCCI. One effort has been to identify funding sources for buildings that would require compliance with the Vietnam energy code and with a green building certification system recognized by MOC, including:

- “High Performance” very low energy buildings,
- Buildings that meet Green Building Certification criteria preferably at advanced certification levels.
- Net Zero Energy buildings that integrate EE and RE into advanced building designs using integrated design strategies.

Develop Advance Training Program to Enable High Performance, Green Buildings

The Program will continue to implement in Year 3 an ambitious capacity building program via a series of seminars on technical, policy and financing issues to transform the buildings sector market and to improve investment in very energy efficient, green buildings with very low GHG output. Early seminars and webinars include:

- How to Develop and Certify Green Buildings,
- Integrated design techniques to facilitate the development in Vietnam of energy efficient, green buildings,
- Energy simulation techniques for high performance green buildings, as part of an in-depth capacity-building effort for energy simulation by Vietnamese architects, engineers, and analysts.

Almost 500 people received training by the end of year 2 of the project, even as the training program was just ramping up for activities through the fall of 2017.

Early in Year 3, this training plan will be refined and a detailed schedule will be generated for developing and delivering the higher priority seminars.

First Study Tour

A study tour to the United States will be carried out in November 2014, in collaboration with Winrock head office and sub-contractor Alliance to Save Energy. A delegation of 7 architects, engineers, and other officials from the MOC will visit DC, NYC, SE Texas, and the SF Bay Area. The purpose of the study tour is to expose these MOC key professionals and decision-makers to effective examples of

energy and green building policies and programs in the US. Two Program staff will accompany the group as technical translators and facilitators.

Second Study Tour

A second study tour to the United States is planned for late in Year 3 or early in Year 4, in collaboration with Winrock head office and sub-contractor Alliance to Save Energy. It is anticipated that a second delegation of 8 architects, engineers, and other officials from the MOC will visit various locations in the US, perhaps DC, NYC, Florida, and the SF Bay Area. The purpose of the study tour is to expose these MOC key professionals and decision-makers to effective examples of energy and green building policies and programs in the US. One of two Program staff will accompany the group as technical translators and facilitators.

Cross-cutting Activities

Gender

A gender and energy specialist from Winrock's home office will provide Gender Sensitivity Training to Program Staff in the 1st quarter of Year 3, to increase Program staff's awareness of gender issues and provide with a clear framework for designing and implementing future activities in a more gender-sensitive manner (e.g. women-only trainings, when appropriate). Program staff will also develop a Gender Action Plan to guide future activities for the remainder of the project.

Environmental Compliance

The Program team will continue to monitor and evaluate program activities for environmental compliance.

Communications

The Communications team will continue to provide support to the Program in the following areas:

- Creation of a project website where all kind of information related to the project activities, EE, GB, GG can be disseminated;
- Development of success stories and dissemination in appropriate communication channels;
- Conduct of a networking meeting for architects, engineers and other working in building sector will be held in cooperation with E4G (Vietnam Green Building Database and Network);
- Conduct a series of training seminars throughout Year 3, including several half-day training seminars now being planned for December 2014 and January 2015. Senior US experts will be featured presenters at these upcoming seminars.
- Recording of seminars and locating the recordings on the MOC website in order to provide just-in-time training opportunities via the Internet for interested persons throughout Vietnam.
- Conduct a year-long series of seminars on energy simulation, to be co-sponsored with ITA, NUCE, VIAR, and others.