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SECTION A. Project Title

[See Toolkit 1.6]

Project title: Biogas Program for Animal Husbandry Sector of Vietnam (BP)

Acronym: BP

Version of the Gold Standard Passport: V1.3

Date of completion: 01/NOV/2011

SECTION B. Project description

[See Toolkit 1.6]

Start date of the program: 1/1/2007 (start date of BP phase II)

The Biogas Program for Animal Husbandry sector of Vietnam (BP)

Project “Biogas Program for the Animal Husbandry Sector in Vietnam” is implemented by Livestock Production Department the Biogas Project Division (BPD) (under MARD) in cooperation with Netherlands Development Organisation – SNV. Overall objectives of project are (i) exploiting effectively biogas technology and developing a commercial viable biogas sector in Vietnam; and (ii) contributing to rural development and environmental protection via provision of clean and affordable energy to rural households, improvement of community’s sanitation and rural people’s health, creation of job for rural labour and reduction of greenhouse gas emission.

The scenario existing prior to the project activity

Before the onset of the project activities, most households with the technical potential for a biodigester depended predominantly on wood and coal for their thermal energy demand for cooking and kerosene for lighting. The reliance on these fuels cause substantial indoor air pollution (with related health hazards) and are predominantly of non-renewable origin. A substantial part of wood is collected, which is both a drudgery and a significant time expenditure for especially women. Fuels that are bought are a burden on the limited household’s revenues. Unhygienic animal waste management practices and the lack of access to basic sanitation result in pollution, foul odour, methane emissions and a relatively high prevalence of hygiene related diseases, such as diarrhoea.

The purpose of BP

The purpose of the project activity is to (further) develop the commercial and structural deployment of domestic biogas in Vietnam. To that extent, the project will:

- Promote the long-term utilization of renewable energy produced in an environmentally compatible and economically viable way;
- Increase the awareness of prospective livestock smallholder households and extension workers on the full extent of the potential costs and benefits of domestic biogas installations;
- Strengthen the supporting capacity of involved Biogas Construction Teams (BCTs) and (non-)

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Government officials regarding all aspects of marketing, construction, after sales service and quality management of domestic biogas installations;

- Support the development of a commercially viable, market oriented domestic biogas sector in Vietnam;
- Strengthen the institutional infrastructure for coordination and implementation of sustained dissemination of domestic biogas at national, provincial and district level.

The project will build on the achievements of the “Support Project to the Biogas Programme for the Animal Husbandry Sector in some Provinces of Vietnam” (BP I). Phase II of the project will cover 50 out of Vietnam’s 65 provinces, supporting the construction of over domestic biogas installations over the period January 2007 – December 2012. Phase III will built on phase II and starts in 2013. Concrete targets for phase III have not been set due to lack of funding. Carbon finance is sought to enable BP to achieve the BP II targets and to finance phase III.

With implementation of this Project, greenhouse gas (GHGs) emissions will be reduced not only through the displacement of biomass and fossil fuels currently used in stoves with clean and efficient biogas technology, but also by introducing a proper animal waste management system (AWMS).

Emission reductions resulting from the project activities

Domestic household digesters are in this document referred to as ‘biodigesters’. In the digester a consortia of microbes breakdown manure, a product of this process is biogas. The released biogas is captured in the gasholder in the digester and destroyed for energy services. In each contracted household, a biodigester, an overflow pit, a number of biogas lamps, a number of biogas stoves, a toilet (unless the farmer already has a toilet or if they’re not interested) and the necessary piping will be installed.

GHG emission reductions: The technology reduces GHG emission through three pathways:

1. The displacement of non-renewable cooking and lighting fuel by a renewable fuel: biogas;
2. The avoidance of methane emissions from the animal waste management system by capturing and destroying methane in an energy service device;
3. The displacement of chemical fertilizers by bio-slurry. The production of chemical fertilizers results is energy intensive and the application to the soil result in N₂O emissions.

The emission reductions are realized by installing biodigester. The biodigesters have a digester size, of between 4 to 50 m³ depending on the amount of manure available at household level.

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SECTION C. Proof of project eligibility

C.1. Scale of the Project

[See Toolkit 1.2.a]

Please tick where applicable:

Project Type	Large	Small
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
	x	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>

C.2. Host Country

[See Toolkit 1.2.b]

Socialist Republic of Vietnam

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C.3. Project Type

[See Toolkit 1.2.c and Toolkit Annex C]

Please tick where applicable:

Project type	Yes	No
Does your project activity classify as a Renewable Energy project?	x	<input type="checkbox"/>
Does your project activity classify as an End-use Energy Efficiency Improvement project?	<input type="checkbox"/>	x

Please justify the eligibility of your project activity:

Project activities and the Gold Standard aim:

Gold Standard Aim: The overriding aim of the Gold Standard is to promote investments in energy technologies and energy management techniques that mitigate climate change, promote (local) sustainable development and are directed towards a transition to non-fossil energy systems.

The activities of BP conform to this aim, since:

- *Biogas from animals and human waste is a renewable energy source, which mitigates GHG emission by displacing fossil and non-renewable cooking and lighting fuels;*
- *Capturing methane emission in a biodigester and destroying it for the above mentioned energy services will avoid the methane emission to the atmosphere from animal waste management system of the baseline situation;*
- *The deployment of biodigesters as an indigenous sustainable technology results in a substantial investment in this renewable energy technology;*
- *Local sustainable development is ensured by the creation of job opportunities in finance, the construction sector (technicians, masons) and the establishment of licensed biodigester construction enterprises.*
- *Environmental integrity is ensured, the treatment of waste in a biodigester, reduces pathogen count, improves sanitation and hygiene, avoids indoor air pollution and deforestation;*
- *The GS requires in Annex C that 65% of the biogas is utilized by showing that systems are in place to maximise the utilization ratio. All household have installed a stove and all household use biogas for cooking. Some households have other equipment installed such as biogas lamps, biogas heaters, biogas water heaters, biogas rice cookers and biogas generators. The programs provides training to all biogas users on how to use all the biogas and how to use all of the biogas by investing in biogas appliances. BP confirm that much more than 65% of the biogas is used.*

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The project activity involves a large amount of small, distributed cooking generation devices using biogas from anaerobic digestion of animal waste. Biogas from animal waste is by definition renewable.

Pre Announcement	Yes	No
Was your project previously announced?	x	<input type="checkbox"/>

Explain your statement on pre-announcement

The programme has announced that it seeks carbon finance already during phase I, see http://www.noccop.org.vn/Data/profile/Airvariable_Projects_75233Tong%20hop%20PIN.pdf

Or a copy of the webpage below.

DANH SÁCH PIN ĐÃ ĐƯỢC DNA VIỆT NAM XÁC NHẬN

STT	Tên Dự án		Địa điểm	Tổng tiềm năng giảm phát thải (tCO ₂)	Xác nhận
	Tên tiếng Việt	Tên tiếng Anh			
1.	Khu liên hợp xử lý chất thải Nghi Yên	Nghi Yen waste treatment complex	Tỉnh Nghệ An	2.176.000 - 2.676.000 / 10 năm	Số 2368/BTNMT-HTQT ngày 05/7/2005
2.	Phát triển dầu dừa diesel sinh học	Model Coconut Biodiesel Development	Tỉnh Bình Định	614.700 / 10 năm	Số 3115/BTNMT-HTQT ngày 03/8/2005
3.	Phát triển ứng dụng của LPG cho các phương tiện giao thông đường bộ	Expand the use of LPG, a Clean Fuel, for Road Vehicle	TP. Hà Nội, Hồ Chí Minh, Đà Nẵng	42.980 / 10 năm	Số 3657/BTNMT-HTQT ngày 14/9/2005
4.	Nhà máy phong điện xã Nhơn Châu (Cù Lao Xanh)	Commune Nhon Chau (Cu Lao Xanh) wind farm	Tỉnh Bình Định	12.000 / 10 năm	Số 4291/BTNMT-HTQT ngày 31/10/2005
5.	Chương trình Carbon và tái trồng "Rừng Vàng"	"Rung Vang" Reforestation and Carbon Programme	Tỉnh Thừa Thiên Huế	508.000 (2007 - 2012)	Số 2264/BTNMT-HTQT ngày 05/6/2006
6.	Chương trình khí sinh học cho ngành chăn nuôi Việt Nam giai đoạn 2003-2005	Biogas Programme for the Animal Husbandry Sector of Viet Nam, Phase 2003-2005	Tại 12 tỉnh	306.000 - 765.000 / 10 năm	Số 4184/BTNMT-HTQT ngày 28/9/2006

The PDD details the pre-consideration of carbon finance.

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C.4. Greenhouse gas

[See Toolkit 1.2.d]

Greenhouse Gas	
Carbon dioxide	X
Methane	X
Nitrous oxide	X

C.5. Project Registration Type

[See Toolkit 1.2.f]

Project Registration Type	
Regular	<input type="checkbox"/>

Pre-feasibility assessment	Retroactive projects (T.2.5.1)	Preliminary evaluation (eg: Large Hydro or palm oil-related project) (T.2.5.2)	Rejected by UNFCCC (T2.5.3)
	x	<input type="checkbox"/>	<input type="checkbox"/>

If Retroactive, please indicate Start Date of Construction dd/mm/yyyy: 1/1/2007

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SECTION D. Unique project identification

D.1. GPS-coordinates of project location

[See Toolkit 1.6]

	Coordinates
Latitude	21° 2' 0" N
Longitude	105° 51' 0" W



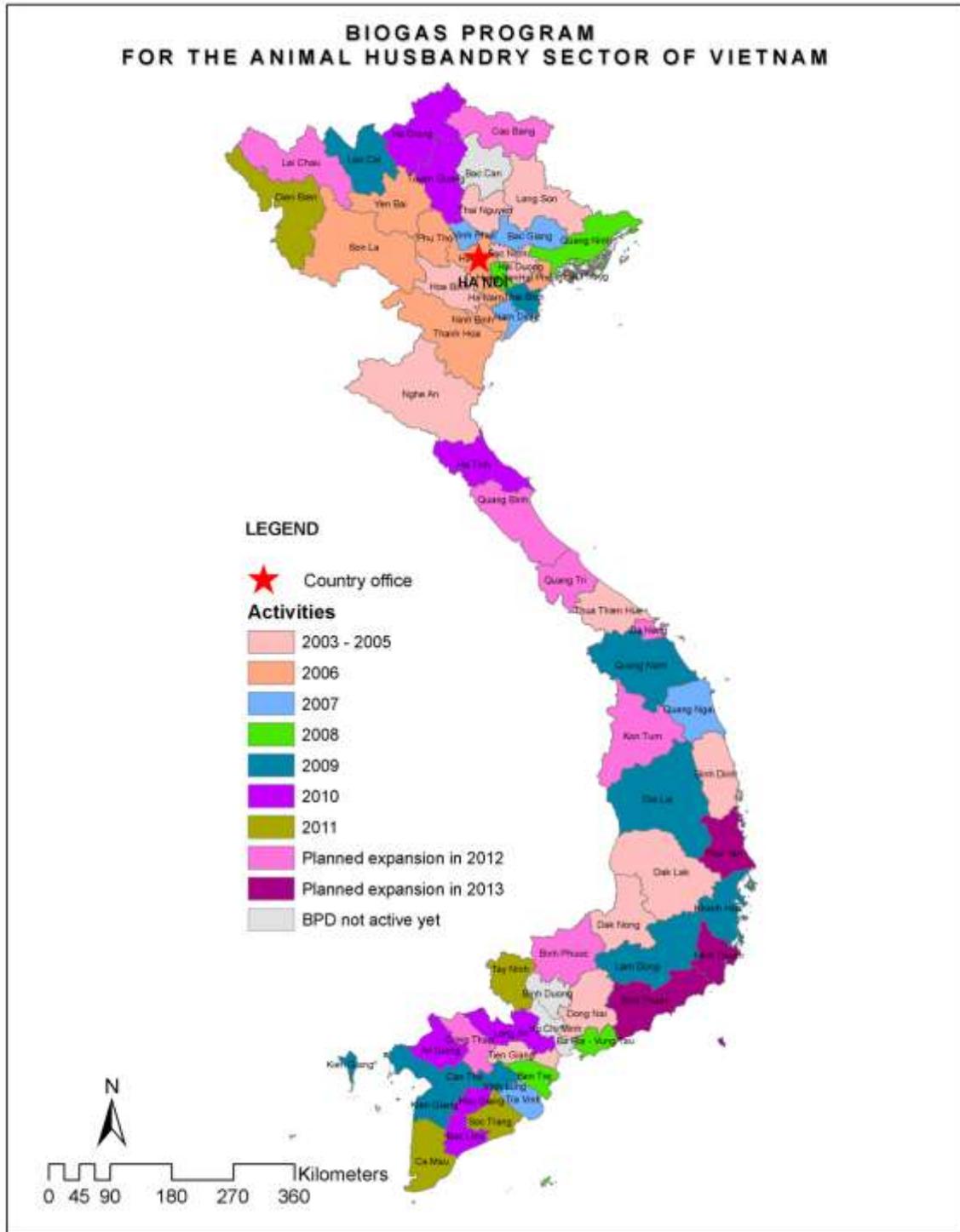
Explain given coordinates

The GPS coordinates are of the head office of BPD. The programme is dispersed over a great number of provinces. The map hereunder shows where the programme is active. Due to the sheer number of biodigesters it is impossible to provide the coordinates of each unit.

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D.2. Map

[See Toolkit 1.6]



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SECTION E. Outcome stakeholder consultation process

E.1. Assessment of stakeholder comments

[See Toolkit Annex J]

[See Local Stakeholder Consultation Report B.5 and insert table from ii Assessment of comments. Insert a summary of alterations based on comments]

Stakeholder Comment	Assessment	Was comment taken into account (Yes/ No)?	Explanation (Why? How?)
<p>Air quality: Group 1: some complaint about a bad smell when turning on the gas first time in the morning Group 2: Good, no more eye disease, better smell, Group 3: Air quality improved, better smell, no gas leakage due to well-managed oversupply Group 4: One complaint about air pollution caused by factories nearby that affects the air improved by biogas plant</p>	<p>Different opinions were expressed in 2 groups when commenting on the quality of air There are opinions on pollutants but not caused by biogas plants, they come from fertilizer factories and paper mills in the vicinity</p>	yes	Bad smell can be reduced by sealing off the tank, using the gas more often. Using a filter is too expensive for most.
<p>Water quality <i>Group 1: Water in streams is obviously cleaner. Less discharge into the water streams.</i> <i>Group 2: Surface water is less polluted comparing to before biogas installation</i> <i>Group 3&4: Surface water in locality is obviously cleaner, the colour change from black to grey. Less discharge into the water streams, less urine penetrating to underground water</i></p>	All groups have same opinion on this indicator	no	All comments were positive. Clear instructions necessary to avoid feeding too much, and too short retention time. Only if dung is not fully disintegrated a bad smell results.
<p>Soil quality: Group 1 and 2 - Visible change in colour is observed prior (black colour) and after having</p>	Not only biogas user but also non biogas user know about this benefit	yes	Bio-slurry cannot be used in concentrated ratio, better to dilute it

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<p>biogas plant (brown);</p> <ul style="list-style-type: none"> - The soil became softer - Nutrition stays longer in the soil, thus significantly improved, very good for crops <p>Group 3: Soil quality improved, Some households give slurry away, as they have no crops and no market for bio slurry. One complained that bio slurry causes his vegetables to die</p> <p>Group 4: The soil became softer. Nutrition stays longer in the soil, thus significantly improved, very good for vegetables, tea and orchard.</p>	<p>by observing the utilization of bio-slurry by neighbours</p>		<p>and use as fertilizer directly applied to the soil. Training materials are provided to the users on that</p>
<p>Other pollutants</p> <p><i>Group 1:</i></p> <ul style="list-style-type: none"> - No other pollutant, as soon as there is leakage with methane gas in the biogas plant, the household fixes immediately reacts by filling water into the digester neck, turning on biogas cook stove to reduce gas pressure; using gas pressure meter. <p><i>Group 2:</i></p> <ul style="list-style-type: none"> - Bad smell when turning on cooking stove - Sometimes surplus of gas creates strong pressure <p><i>Group 3:</i></p> <ul style="list-style-type: none"> - No other pollutant, if there is oversupply at night, farmer has to get up and boil water or turn on stove to reduce gas pressure. <p><i>Group 4:</i></p> <p><i>Gas leakage due to the fact that pipes or valves are poor</i></p>	<p>There are opinions on pollutants but not considered as big problem</p>	<p>yes</p>	<p>Provide proper instruction in operation manual, make pressure meter compulsory. That way households know how much gas they have.</p> <p>Bad smell from the stove is an advantage as it only appears when gas is leaking. A burning stove does not smell.</p> <p>Oversupply is being mitigated by training users to boil water, invest in equipment or share to the neighbours.</p> <p>Provide safety leaflet to users</p>
<p>Biodiversity</p> <p>Reduced use of fire woods for domestic energy</p> <p>Improved soil quality contributing to improved plantation productivity (e.g. increased sales of Vietnamese traditional sticky rice leaves)</p> <p>Reduced use of fire woods, char coal, farmers don't know where the wood comes from (from natural forest or production forest)</p> <p>Improved soil quality contributing to improved plantation productivity</p>	<p>This indicator is difficult for farmer to assess as they see no direct relationship to biogas.</p>	<p>no</p>	<p>Not applicable</p>
<p>Quality of employment</p> <ul style="list-style-type: none"> - Free women and children from wood/rice straw collection for other social or schooling activities 	<p>Assessment is more exact in villages where farmers pursue</p>	<p>no</p>	<p>Only positive comments</p>

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<ul style="list-style-type: none"> - Higher income for biogas masons in comparison with other types of construction works <p>Group 3: Biodigesters free women and children from dirty, hard works such as manure collection, selling or processing. Free time used for other social or schooling activities.</p> <p>Group 4: Higher income for biogas masons in comparison with other types of construction works, less dangerous work since biogas plant place underground.</p>	<p>secondary jobs in biodigester construction</p>		
<p>Livelihood of the poor</p> <p>Biogas contributes to reducing workload of family members: men have more time (2 hours) for sport activities, women more time for social and other income generation activities (e.g. embroidery).</p> <p>Group 2: Poor people cannot afford biogas digester or they do not have animals.</p> <p>Group 3 and 4</p> <p>Biogas contributes to reducing workload of family members</p> <p>Poor people cannot afford biogas digester or they do not have animals.</p> <p>One women in group 1 plans to borrow money to finance biogas digester since she has to cover her son's university fee with her saving.</p>	<p>Farmers participated in workshops are not poor people</p>	<p>yes</p>	<p>The programme does not target the poorest of the poor, as they do not have enough animals and manure to feed the smallest biodigester. Nevertheless, some biogas users can be considered poor and their livelihood will improve and the program creates employment opportunities that can benefit the poor.</p>
<p>Access to affordable and clean energy services:</p> <ul style="list-style-type: none"> - The upfront investment is high and poor HH without animal husbandry activities can not afford - Poor households with few pigs can invest by borrowing money from friends and relatives to invest in biogas plants - Non -smoke and cleaner kitchen more appropriate for modern kitchen appliances <p>Group 3 and 4</p> <ul style="list-style-type: none"> - The upfront investment is high including paper work to get support by project and subsidy rate is low. - Poor households with few pigs can invest by borrowing money from friends and relatives to invest in biogas plants <p>In general biogas is clean energy and affordable for local people</p>	<p>Opinions are contrary</p>	<p>yes</p>	<p>Biogas users will have access to a cheap source of energy as manure is available for free to the farmers.</p>
<p>Human and institutional capacity</p> <ul style="list-style-type: none"> - Increased knowledge on biogas technology and biogas -related knowledge (global warming, CDM, climate change) - Increased free time from household workload allowing male and female farmers to participate in other community activities or economic 	<p>Very few comment on this indicator</p>	<p>yes</p>	<p>Training for users is very important, the programme will continue with this</p>

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<p>activities Group 3 and 4</p> <ul style="list-style-type: none"> - Increased knowledge on biogas technology and biogas -related knowledge (global warming, CDM, climate change) - Improved gender-balance in locality, more women take part in training, meeting, WS with their own opinions - Increased familiarity with new technology; more time for other family economic activities, 			
<p>Quantitative employment and income generation</p> <ul style="list-style-type: none"> - Women and children have more free time to engage in other income generation activities (embroidery, gardening) - Higher income for biogas masons (compared to other civil construction jobs); - Current mason teams are potential to become SMEs - Less money spent on conventional domestic energy sources <p>Group 3 and 4</p> <ul style="list-style-type: none"> - Income generation from higher productivity crops - Saving up to 300,000 per month - Higher income for biogas masons (compared to other civil construction jobs); <p>Current mason teams have potential to become SMEs</p>	Farmers know about benefits of biogas technology	no	All comments are positive and shared
<p>Balance of payments and investment</p> <p>Difficult to calculate due to low opportunity costs for agricultural residues used as conventional energy source</p> <p>Group 3 and 4</p> <p>Difficult to calculate due to costing use of rice straw and agricultural biomass used for conventional energy source</p>	Many comments are very general about benefits	no	Difficult to relate the activities with this indicator
<p>Technology transfer and technological self-reliance</p> <ul style="list-style-type: none"> - Simple operation and maintenance after being trained - Easy to train and expand mason teams - Technology transfer is appropriate as construction materials are locally available. 	Farmers understand biogas technology very well	yes	Instructions and manual should be developed more attractive and simple. This is done regularly with the training manual
<p>Do-no-Harm Indicators:</p>			
<p>Labour condition:</p> <p>Tough working conditions for masons whose work is dependent on weather conditions (very hot during summer time, rainy season)</p> <p>Group 3 and 4</p> <p>Group 3: Hard working conditions for</p>	People have the same comments on working conditions of mason	yes	Hot working conditions can be mitigated with the use of ventilators, a custom in the south. A cover over the biodigester will

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E.2. Stakeholder Feedback Round

Please describe report how the feedback round was organised, what the outcomes were and how you followed up on the feedback.

[See Toolkit 2.11]

Will be organized after the 2 hour consultation with the local GS expert as part of the PFA. The outcome will be include in a future version of this document.

SECTION F. Outcome Sustainability assessment

F.1. 'Do no harm' Assessment

[See Toolkit 2.4.1 and Toolkit Annex H]

Safeguarding principles	Description of relevance to my project	Assessment of my project risks breaching it (low/medium /high)	Mitigation measure
Human rights			
1.The project respects internationally proclaimed human rights including dignity, cultural property and uniqueness of indigenous people. The project is not complicit in Human Rights abuses.	The project is energy demand oriented and the households that are included in the project participate voluntary. The project is not complicit in human rights abuses	None	Not required

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2. The project does not involve and is not complicit in involuntary resettlement.	The biogas digester is constructed at the premises of the household involved in the project and will not result in relocation of persons or households	low	Not required
3. The project does not involve and is not complicit in the alteration, damage or removal of any critical cultural heritage	The biogas digester is constructed at the premises of the household where no critical cultural heritage is to be found	low	Not required
Labour standards			
4. The project respects the employees' freedom of association and their right to collective bargaining and is not complicit in restrictions of these freedoms and rights	The design and construction of the digesters are executed by qualified technicians and masons who are willing to work for the project against a market conform payment. Households are open to contact several masons, as well as other biogas technology suppliers.	low	The programme complies with the Vietnamese Labor Law
5. The project does not involve and is not complicit in any form of forced or compulsory labour	Masons and technicians volunteer to be trained by the project to become officially qualified, the masons are free to work and provide services to farmer households and others on market price basis. Masons work independently of the program and are free to put their knowledge into practice outside the program as well	low	The programme complies with the Vietnamese Labor Law
6. The project does not employ and is not complicit in any form of child labour	All masons involved in the project are certified by the ministry of agriculture and rural development (MARD). MARD only certifies experienced masons above	Low	The programme complies with the Vietnamese Labor Law

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	18 years of age and therefore excludes children.		
7. The project does not involve and is not complicit in any form of discrimination based on gender, race, religion, sexual orientation or any other basis.	Everybody is eligible to work for the project provided that they are experienced, trained and certified by MARD. MARD does not exclude anybody from the training regardless of gender, race, religion, sexual orientation or any other basis. The program tries to actively motivate especially women to take part in the program and benefit from the training and potential income generating activities	Low	The programme complies with the Vietnamese Labor Law. The programme further has an expressed positive gender recruitment policy
8. The project provides workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe or unhealthy work environments.	The design and construction of the digesters are conducted by qualified masons who are certified by MARD. The technology applied is mature. The working environment is safe and healthy, masons are never alone on site. Furthermore to safeguard the safety of both masons and users the biogas user handbook and safety leaflet are distributed to all users. Safety issues is also an important part of the training for masons and technicians, as well as the training for the end user.	Low	The programme complies with the Vietnamese Labor Law. In addition, construction and operation manuals explicitly mention safety precautions.
Environmental Protection			
9. The project takes a precautionary approach in regard to environmental challenges and is not	The construction of household biogas digesters has obvious positive benefits on the local environment and	low	Not required

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<p>complicit in practices contrary to the precautionary principle.</p>	<p>is encouraged by local governments. There is no environmental threat.</p> <p>In addition, the project takes a precautionary approach by certifying masons, quality control of the construction etc.</p>		
<p>10. The project does not involve and is not complicit in significant conversion or degradation of critical natural habitats, including those that are (a) legally protected, (b) officially proposed for protection, (c) identified by authoritative sources for their high conservation value, or (d) recognized as protected by traditional local communities.</p>	<p>Not applicable: biogas installations are constructed on the farm-site. The project has a positive impact on the natural habitat and therefore does not, in any way; result in degradation or conversion of natural habitat.</p>	<p>Low</p>	<p>Not required</p>
<p>11. The project does not involve and is not complicit in corruption.</p>	<p>The cost of construction and implementation will be paid by household farmers on market price basis. Households pay directly to the supplier of construction material. Furthermore a subsidy is only given by the project to households that really installed and took into operation the biogas unit. A throughout quality control and monitoring system is used to check these requirements. Furthermore subsidies are paid through the post-office system in Vietnam only</p>	<p>Low</p>	<p>Not required</p>

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	directly to the owner of the biogas unit whose ID number is on the application. All data on household are entered in to the project database. If the entry by the provincial biogas project division is wrong that cause miss direction for subsidy transfer then the PBPDs will be fully responsible for extra money transfer charge and the delay in transfer process. Any fraud will be reported to relevant authorities for suitable legal action		
Additional relevant critical issues for my project type	Description of relevance to my project	Assessment of relevance to my project (low/medium/high)	Mitigation measure
No additional relevant issues identified			

F.2. Sustainable Development matrix

[See Toolkit 2.4.2 and Toolkit Annex I]

Insert table in section C3 from your Stakeholder Consultation report (Sustainable Development matrix).

Indicator	Mitigation measure	Relevance to achieving MDG	Chosen parameter and explanation	Preliminary score
Gold Standard indicators of sustainable development.	If relevant copy mitigation measure from "do no harm" –table, or include	Check www.undp.org/mdg and www.mdgmonitor.org Describe how your indicator is	Defined by project developer	'

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	mitigation measure used to neutralise a score of '-'	related to local MDG goals		
Air quality		Applies to MDG target 4 (4.1, 4.2), & 5. Clean indoor air will reduce under-five mortality rate (4.1) and infant mortality rate and the disease burden due to indoor air pollution	Parameter: Compared to the baseline the project reduces wood and coal consumption for cooking and kerosene consumption for lighting. Explanation: Substituting traditional cooking fuels, biogas virtually eliminates indoor air pollution resulting from incomplete combustion of agricultural residue, coal and / or firewood	+
Water quality and quantity		Applies to MDG target 7 (7.8, 7.9). Proportion of population using an improved water source and improved sanitation facility.	Domestic biogas plants requires a fair amount of process water on a daily basis Water availability however is not critical in most provinces of Vietnam	0
Soil condition		Applies to MDG target 7B: Reduce biodiversity loss	No harm to the soil is expected to rise from the project	0
Other pollutants			No other pollutant sources identified	0
Biodiversity		Applies to MDG 7; target 7B Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss: Indicator 7.2	Explanation: The installation of a bio-digester will reduce CO ₂ emission compared to the baseline. The production and usage of biogas will result in	+

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		belonging to 7B: CO2 emission reduction	less emissions of methane to the air, as well as less usage of (non-)fossil fuels for household use. Parameter: Emission reduction realized by the project.	
Quality of employment		Applies for MDG, target 1 (1.b). Achieve full and productive employment and decent work for all, including women and young people.	Explanation: Construction and quality control requires well skilled mason and technicians. Parameter: Number of trained masons and technicians trained	+
Livelihood of the poor		MDG, 1.1, 3.4, 4.5	Explanation: Thanks to the project people will use biogas for cooking, a clean and convenient source of energy. This will displace traditional fuels and therefore reduce drudgery and indoor air pollution. This will improve the livelihood of the poor. Parameter: Change in traditional fuel consumption (% of wood, charcoal, agricultural residues coal and kerosene)	+
Access to affordable and clean energy services		MDG 7: Ensure environment sustainability.	Parameter: Reduction in cooking and lighting fuel expenditure reported by households that have biogas Explanation: Domestic biogas installations	+

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			produce clean energy. Substitution of cooking and lighting fuel by biogas is revenue saving since biogas originates from a free energy source (animal and human waste).	
Human and institutional capacity		not applicable	Explanation: It is not expected that human and institutional capacity will improve considerably by the project. Although the project has helped to improve the advanced provincial officers capacity through training of project management (monitoring and evaluation), also advanced masons through business start-up and marketing skill courses.	0
Economic and technological development				
Quantitative employment and income generation		Applies for MDG, target 1 (1.b).	Explanation: A biogas plant saves expenditure and will indirectly contribute to income generation. The biogas digester however does not generate income.	0
Balance of payments and investment		Not applicable		0
Technology transfer and technological self-reliance		Applied to MDG 8: Target 8f: In cooperation with the private sector, make available the benefits of new	Parameter: Number of biodigesters built Explanation: The programme is using indigenous technology and locally available	+

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	technologies, especially information and communications	materials. Construction and after sales services are provided by local artisans. The implementation of the project is a clear example technological self-reliance
Justification choices, data source and provision of references		
Air quality	The indoor air quality will improve significantly, since biogas is a clean fuel which does not emit hazardous pollutants (respirable suspended particulate matter, eye irritating smoke) when combusted (Rehfuss, Mehta et al. 2006) ¹	
Water quality and quantity	Unsafe water and lack of sanitation ranks number 6 of the top 10 disease factors according to the WHO ² . A biodigester treats waste, removes pathogens and coliforms. However as bio-slurry contains the same amount of nutrients as manure, it is not expected that the water quality will decrease or improve considerably.	
Soil condition	The literature shows that bio-slurry has similar characteristics as chemical fertilizer (Srinivasan 2008) ³ , and can therefore displace chemical fertilizers and amend the soil. However, this is not always practiced by farmers as their land is often far away. Therefore no significant improvement of the soil conditions is expected.	
Other pollutants	non identified	
Biodiversity	The installation of biogas plant will reduce CO ₂ emission compared to the baseline, the PDD details the CO ₂ emission realized. Indicator 7.2 can be found here: http://www.undp.org/mdg/goal7.shtml	
Quality of employment	Training of masons will lead to the creation of skills. With these skills masons can work with biodigester or in other construction works ⁴	
Livelihood of the poor	Biogas is a clean fuel which enables household to make a giant leap on the energy ladder (Buysman 2009) ⁵ , it is much cleaner, more	

¹ Rehfuss, E., S. Mehta, et al. (2006). "Assessing Household Solid Fuel Use: Multiple Implications for the Millennium Development Goals." *Environmental Health Perspectives* **114**(3): 373-378.

² WHO (2002). *World Health Report: Reducing Risks, Promoting Healthy Life*. Geneva.

³ Srinivasan, S. (2008). "Positive externalities of domestic biogas initiatives: Implications for financing." *Renewable and Sustainable Energy Reviews* 12(5): 1476-1484.

⁴

http://www.snvworld.org/en/Documents/Biogas_training_manual_for_mason_a_guide_for_trainer_Nepal_1994.pdf

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	convenient, reduces drudgery of fuel wood collection for especially women and children, which allows and empowers women and children to fulfil their potential. The provision of light enables activities in the evening, be it study, reading, opening of shops or for entertainment. These cumulative benefits significantly improves the lives and livelihood of the poor.
Access to affordable and clean energy services	The only costs of biogas are the opportunity costs involved in the daily operation and maintenance of the biogas plant. However, since the time involved in collection fuel wood, tendering the wood fire, cleaning the sooth from the pans is much higher than the total time expenditure of operating the biodigester (ESMAP 2004 ; Dutta, Rehman et al, 1997) ; GTZ, 1999 ; Biogas, being a clean fuel, will reduce the reliance of fuels that are bought, and hence the energy costs will decrease.
Human and institutional capacity	0
Quantitative employment and income generation	0
Balance of payments and investment	0
Technology transfer and technological self-reliance	The use of an in-country developed digester is a clear example of technological self reliance.

⁵ Buysman, E. (2009) *Anaerobic Digestion for Developing Countries with Cold Climates - Utilizing solar heat to address technical challenges and facilitating dissemination through the use of carbon finance*. Faculty of Environmental

Sciences, sub department Environmental Technology. Wageningen. University of Wageningen. Master.

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SECTION G. Sustainability Monitoring Plan

[See Toolkit 2.4.3 and Toolkit Annex I]

Copy Table for each indicator

No	1													
Indicator	Air Quality													
Mitigation measure	not applicable													
<i>Repeat for each parameter</i>														
Chosen parameter	Reduction in fuel (wood, agricultural residues, kerosene and coal) consumption (kg of fuel reduced/year)													
Current situation of parameter	<p>According to the biogas user survey 2011, the average biogas household uses</p> <table border="1" data-bbox="459 902 702 1216"> <thead> <tr> <th>Fuel <i>i</i></th> <th>Average per household (kg/year)</th> </tr> </thead> <tbody> <tr> <td>Charcoal</td> <td>0.0</td> </tr> <tr> <td>Coal</td> <td>0.0</td> </tr> <tr> <td>Firewood</td> <td>142.4</td> </tr> <tr> <td>Agriculture residues</td> <td>84.6</td> </tr> <tr> <td>Kerosene</td> <td>0.0</td> </tr> </tbody> </table>		Fuel <i>i</i>	Average per household (kg/year)	Charcoal	0.0	Coal	0.0	Firewood	142.4	Agriculture residues	84.6	Kerosene	0.0
Fuel <i>i</i>	Average per household (kg/year)													
Charcoal	0.0													
Coal	0.0													
Firewood	142.4													
Agriculture residues	84.6													
Kerosene	0.0													
Estimation of baseline situation of parameter	<table border="1" data-bbox="459 1292 748 1581"> <thead> <tr> <th>Fuel <i>i</i></th> <th>Average per household (kg/year)</th> </tr> </thead> <tbody> <tr> <td>Charcoal</td> <td>93.2</td> </tr> <tr> <td>Coal</td> <td>362.8</td> </tr> <tr> <td>Firewood</td> <td>1855.6</td> </tr> <tr> <td>Agriculture residues</td> <td>556.5</td> </tr> <tr> <td>Kerosene</td> <td>0.7</td> </tr> </tbody> </table>		Fuel <i>i</i>	Average per household (kg/year)	Charcoal	93.2	Coal	362.8	Firewood	1855.6	Agriculture residues	556.5	Kerosene	0.7
Fuel <i>i</i>	Average per household (kg/year)													
Charcoal	93.2													
Coal	362.8													
Firewood	1855.6													
Agriculture residues	556.5													
Kerosene	0.7													
Future target for parameter	Significant reduction realized by the provision of a clean and sustainable fuel: biogas													
Way of monitoring	How	Monitoring survey												
	When	Updated for every 2 years or more frequently												
	By who	BPD or an external consultant												
No	2													
Indicator	Biodiversity													
Mitigation	not applicable													

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measure		
<i>Repeat for each parameter</i>		
Chosen parameter	Reduction in CO2 emission compared to the baseline	
Current situation of parameter	0.43 tCO2/household	
Estimation of baseline situation of parameter	5.35 tCO2/household	
Future target for parameter	Significant reduction of GHG emission realized by the provision of a clean and sustainable fuel: biogas	
Way of monitoring	How	Monitoring survey
	When	Updated for every 2 years or more frequently
	By who	BPD or an external consultant

No	3	
Indicator	Quality of employment	
Mitigation measure	not applicable	
<i>Repeat for each parameter</i>		
Chosen parameter	Number of masons and technicians participating in the trainings	
Current situation of parameter	as of 13/9/2011, 622 technicians and 922 masons participated in the trainings	
Estimation of baseline situation of parameter	0, no masons and technicians are trained prior to the project activity	
Future target for parameter	At least 2 district biogas technicians and 2 biogas masons per district provided with training	
Way of monitoring	How	Training reports of the trainings
	When	compiled by the PBPD and sent to BPD biannually or annually
	By who	BPD staff, PBPD staff (Provincial BPD staff)

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No	4																										
Indicator	Livelihood of the poor																										
Mitigation measure	not applicable																										
<i>Repeat for each parameter</i>																											
Chosen parameter	Change in traditional fuel consumption (% of wood, charcoal, agricultural residues coal and kerosene)																										
Current situation of parameter	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Fuel i</th> <th style="text-align: center;">baseline (kg/year/hh)</th> <th style="text-align: center;">project (kg/year/hh)</th> <th style="text-align: center;">% reduced</th> </tr> </thead> <tbody> <tr> <td>Charcoal</td> <td style="text-align: center;">93.18</td> <td style="text-align: center;">0.00</td> <td style="text-align: center;">100%</td> </tr> <tr> <td>Coal</td> <td style="text-align: center;">362.78</td> <td style="text-align: center;">0.00</td> <td style="text-align: center;">100%</td> </tr> <tr> <td>Firewood</td> <td style="text-align: center;">1855.59</td> <td style="text-align: center;">142.42</td> <td style="text-align: center;">92%</td> </tr> <tr> <td>Agriculture residues</td> <td style="text-align: center;">556.46</td> <td style="text-align: center;">84.62</td> <td style="text-align: center;">85%</td> </tr> <tr> <td>Kerosene</td> <td style="text-align: center;">0.67</td> <td style="text-align: center;">0.00</td> <td style="text-align: center;">100%</td> </tr> </tbody> </table>			Fuel i	baseline (kg/year/hh)	project (kg/year/hh)	% reduced	Charcoal	93.18	0.00	100%	Coal	362.78	0.00	100%	Firewood	1855.59	142.42	92%	Agriculture residues	556.46	84.62	85%	Kerosene	0.67	0.00	100%
Fuel i	baseline (kg/year/hh)	project (kg/year/hh)	% reduced																								
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Coal	362.78	0.00	100%																								
Firewood	1855.59	142.42	92%																								
Agriculture residues	556.46	84.62	85%																								
Kerosene	0.67	0.00	100%																								
Estimation of baseline situation of parameter	0% change, none of the household use biogas before they install a a biogas plant																										
Future target for parameter	Significant reduction in traditional fuel consumption by biogas																										
Way of monitoring	How	Monitoring survey																									
	When	Updated for every 2 years or more frequently																									
	By who	BPD or an external consultant																									

No	5		
Indicator	Access to affordable and clean energy services		
Mitigation measure	not applicable		
<i>Repeat for each parameter</i>			
Chosen parameter	Parameter: Reduction in cooking and lighting fuel expenditure reported by households that have biogas		

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Current situation of parameter		Baseline (000VND/month)	Project (000VND/month)	Reduction (000VND/month)
	Fuel i			
	Firewood total	94.2	8.9	85.3
	Kerosene	0.0	0.0	0.0
	LPG	97.8	5.0	92.8
	Charcoal	0.0	0.0	0.0
	Coal	95.5	7.4	88.2
	Agricultural residues	18.8	2.4	16.3
	Total	306.4	23.7	282.6
	Baseline expenditure	306,361	VND/month/hh	
Project expenditure	23,728	VND/month/hh		
Reduction	282,634	VND/month/hh		
Current situation is 23,728 VND/month/hh fuel expenditure				
Estimation of baseline situation of parameter	Baseline estimate is around 306,500 VND/month fuel expenditure			
Future target for parameter	Continuation of fuel expenditure changes as observed in BUS 2011 (see above)			
Way of monitoring	How	Monitoring survey		
	When	Updated for every 2 years or more frequently		
	By who	BPD or an external consultant		

No	6
Indicator	Technology transfer and technological self-reliance
Mitigation measure	not applicable
<i>Repeat for each parameter</i>	
Chosen parameter	Number of biodigesters built
Current situation of parameter	around 111,052 as of September 2011
Estimation of baseline situation of parameter	Before the BP phase II BPD has built around 25,672 units (phase I units).
Future target for parameter	140,000 biogas plant by phase II and 200,000 for phase III biogas (2013-2018)
Way of monitoring	How The biogas plant is recorded in form 03 filled in by the district technician during the commissioning and quality inspection of the constructed biogas plant.

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	When	After completed construction of the biogas plant and before commissioning and inspection. The provincial technician inspects the filled in form 03 and enters the data into the central database.
	By who	District technician/provincial technician.

Additional remarks monitoring

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SECTION H. Additionality and conservativeness



This section is only applicable if the section on additionality and/or your choice of baseline does not follow Gold Standard guidance

H.1. Additionality

[See Toolkit 2.3]

Additionality follows GS guidance. The PDD details the additionality assessment.

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H.2. Conservativeness

[See Toolkit 2.2]

Conservativeness in emission claims:

1. 10% of the total captured and destroyed methane will be considered as leakage, this is conservative, since the retention time in the biodigester is relatively long and consequently most biodegradable VS is converted into biogas.
2. The GS-VER methodology assumes that 2% of the biogas is not combusted due to combustion inefficiencies. Laboratory testing of the stoves however have not detected methane release from the stoves. The 2% not combusted is therefore conservative.
3. Emission reductions from electricity savings by using biogas lamps instead of electricity or other appliances that save electricity (i.e. biogas rice cookers, biogas water heaters, biogas generators, biogas heaters) is not accounted for.
4. The GWP of methane used is 21, more recent assessments by the IPCC put the GWP of methane at 25
5. The emission reductions from the reduction of chemical fertilizers are not included, which amount to 0,08 tCO₂/year. The reduction of N₂O emission from the application of chemical fertilizers, a very potent greenhouse gas, with a GWP of 310, are not claimed, the total emission claims are therefore conservative.

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ANNEX 1 ODA declaration

[See Toolkit Annex D]



MARD

**DEPARTMENT OF LIVESTOCK PRODUCTION
MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT OF S.R. VIET NAM**

Address: 2 Ngoc Ha Street,
Ba Dinh District,
Hanoi – Vietnam.

Tel: (84-4) 3734.5443
Fax: (84-4) 3734.5444
<http://www.mard.gov.vn>

Date: Hanoi, 30 August 2011

Project reference: The Project “Biogas Program for the Animal Husbandry sector of Vietnam”

To: Gold Standard Foundation

Declaration of Non-Use of Official Development Assistance by Project Owner

As Project Owner of the above-referenced project, acting on behalf of all project participants, I now make the following representations:

I hereby declare that I am duly and fully authorized by the project owner of the above-referenced project, acting on behalf of all project participants, to make the following representations on Project Proponent’s behalf:

I. Gold Standard Documentation

I am familiar with the provisions of Gold Standard Documentation relevant to Official Development Assistance (ODA). I understand that the above-referenced project is not eligible for Gold Standard registration if the project receives or benefits from Official Development Assistance under the condition that some or all credits coming out of the project are transferred to the ODA donor country. I now expressly declare that no financing provided in connection with the above-referenced project has come from or will come from ODA that has been or will be provided under the condition, whether express or implied, that any or all of the credits [CERs, ERUs or VERs] issued as a result of the project’s operation will be transferred directly or indirectly to the country of origin of the ODA.

II. Duty to Notify Upon Discovery.

If I learn or if I am given any reason to believe at any stage of project design or implementation that ODA has been used to support the development or implementation of the project, or that an entity providing ODA to the host country may at some point in the future benefit directly or indirectly from the credits generated from the project as a condition of investment, I will make this known to the Gold Standard immediately.

III. Sanctions. I am fully aware that under Section 10 of the Gold Standard Terms and Conditions sanctions and damages may be incurred for the provision of false information related to Projects and/or Gold Standard credits.

Signed:



Name: Hoang Kim Giao
Title: Program Director