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16 October 2018

INDIVIDUAL CONSULTANT PROCUREMENT NOTICE

for individual consultants and individual consultants assigned by consulting firms/institutions

Country:	Viet Nam
Description of the assignment:	01 International Consultant to provide technical assistance on the Assessment of industrial and production sectors that present opportunities for the introduction of Green Chemistry and energy saving measures in Vietnam.
Period of assignment/services (if applicable):	December 2018 to July 2019 (50 working days)
Duty Station	Home based and Hanoi with travel to provinces (if required)
Tender reference:	A-181004

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1. Submissions should be sent by **email** to: quach.thuy.ha@undp.org no later than:
Tuesday 4 December 2018

With subject line:

A-181004-Intl Consultant for assessment of industrial and production sectors (Green Chemistry)

Submission received after that date or submission not in conformity with the requirements specified in this document will not be considered.

Note:

- Any individual employed by a company or institution who would like to submit an offer in response to this Procurement Notice must do so in their individual capacity, even if they expect their employers to sign a contract with UNDP.
- Maximum size per email is **30 MB**.
- Any request for clarification must be sent in writing, or by standard electronic communication to the address or e-mail indicated above. Procurement Unit – UNDP Viet Nam will respond in writing or by standard electronic mail and will send written

copies of the response, including an explanation of the query without identifying the source of inquiry, to all consultants.

- After submitting proposal, bidder should send notification by email (without attachment) to: procurement.vn@undp.org informing that the bidder has submitted proposal. UNDP will not be responsible for the missing of proposal if the bidder does not send notification email to above address.
- Female consultants are encouraged to bid for this required service. Preference will be given to equally technically qualified female consultants.

2. Please find attached the relevant documents:

- [Terms of Reference \(TOR\)](#)..... (Annex I)
- [Individual Contract & General Conditions](#)..... (Annex II)
- [Reimbursable Loan Agreement](#) (for a consultant assigned by a firm) ... (Annex III)
- [Letter to UNDP Confirming Interest and Availability](#) (Annex IV)
- [Financial Proposal](#) (Annex V)

3. Interested individual consultants must submit the following documents/information (in English, PDF Format) to demonstrate their qualifications:

a. Technical component:

- **Signed** Curriculum vitae
- **Signed** Letter to UNDP Confirming Interest and Availability
- Copy of 1-3 publications/writing samples on relevant subject.
- Reference contacts of past 4 clients for whom you have rendered preferably the similar service (including name, title, email, telephone number, address...)

b. Financial proposal (with your signature):

- The financial proposal shall specify a total lump sum amount in **US dollar for International Consultant** including consultancy fees and all associated costs i.e. airfares, travel cost, meal, accommodation, tax, insurance etc. – see format of financial offer in Annex V.
- Please note that the cost of preparing a proposal and of negotiating a contract, including any related travel, is not reimbursable as a direct cost of the assignment.
- If quoted in other currency, prices shall be converted to the above currency at UN Exchange Rate at the submission deadline.

4. Evaluation

The technical component will be evaluated using the following criteria:

Consultant(s)' experiences/qualification related to the services		
1	Postgraduate or higher education degree in chemistry, industrial chemistry, chemical management/ application, bio-chemistry, hazardous waste management, environmental management and policy, or related fields;	150
2	At least 5 years of practical working experience in development field, with specific experience on environmental management, chemical and waste management in industrial processes, management of hazardous and toxic chemical including POPs/PTSs and Mercury;	150
3	At least 7 years of cumulative experience gathered in at least 3 of the following areas: energy saving in industrial processes, management of POPs, management of hazardous chemicals and hazardous waste, environmental monitoring of industrial processes (including the development of monitoring plans), sampling of waste and environmental media, handling of waste and hazardous substances;	250
4	Knowledge of the use of chemicals in industrial processes with specific reference to two or more sectors among the six targeted industrial sectors;	100
5	Good understanding and knowledge of MEAs (especially Stockholm Convention on POPs, Minamata Convention on Mercury, Basel Convention)	100
6	Good understanding of POPs/mercury baseline assessment and calculation;	150
7	Fluent in written and spoken English (with submission of at least two sample reports)	100
Total		1000

A two-stage procedure is utilized in evaluating the submissions, with evaluation of the technical components being completed prior to any price proposals being opened and compared.

The price proposal will be opened only for submissions that passed the minimum technical score of 70% of the obtainable score of 1000 points in the evaluation of the technical component. The technical component is evaluated on the basis of its responsiveness to the Term of Reference (TOR). Maximum 1000 points will be given to the lowest offer and the other financial proposals will receive the points inversely proportional to their financial offers. i.e. $S_f = 1000 \times F_m / F$, in which S_f is the financial score, F_m is the lowest price and F the price of the submission under consideration.

The weight of technical points is 70% and financial points is 30%.

Submission obtaining the highest weighted points (technical points + financial points) will be selected.

Interview with the candidates may be held if deemed necessary.

5. Contract

“Lump-sum” Individual Contract will be applied for freelance consultant (Annex II)

“Lump-sum” RLA will be applied for consultant assigned by firm/institution/organization (Annex III)

Documents required before contract signing:

- International consultant whose work involves travel is required to complete the courses on Basic Security in the Field **and** Advanced Security in the Field and submit certificates to UNDP before contract issuance.

Note: In order to access the courses, please go to the following link: <https://training.dss.un.org>
The training course takes around 3-4 hours to complete. The certificate is valid for 3 years.

- Full medical examination and Statement of Fitness to work for consultants from and above 65 years of age and involve travel. (This is not a requirement for RLA contracts).
- Release letter in case the selected consultant is government official.

6. Payment

UNDP shall effect payments to the consultant (by bank transfer to the consultant's bank account provided in the vendor form upon acceptance by UNDP of the deliverables specified the TOR.

The payment milestones consist of:

- The first instalment of 10% contract amount will be paid upon submission of the detail assignment plan agreed by the UNDP, PMU/MOIT;
- The second instalment of 40% contract amount will be paid upon completion of the first mission to Viet Nam with submission deliverables 2, 3, 5, with satisfactory acceptance by UNDP and MOIT/PMU,
- The last payment of 50% will be paid upon the completion of the second mission to Viet Nam and all products required by the assignment, with satisfactory acceptance by UNDP and MOIT/PMU.

If two currencies exist, UNDP exchange rate will be applied at the day UNDP instructs the bank to effect the payment.

7. Your proposals are received on the basis that you fully understand and accept these terms and conditions.

ANNEX I

TERMS OF REFERENCE

INTERNATIONAL CONSULTANT TO PROVIDE TECHNICAL ASSISTANCE ON THE ASSESSMENT OF INDUSTRIAL AND PRODUCTION SECTORS THAT PRESENT OPPORTUNITIES FOR THE INTRODUCTION OF GREEN CHEMISTRY AND ENERGY SAVING MEASURES IN VIETNAM.

1) GENERAL BACKGROUND

The Viet Nam Chemical Agency (Vinachemia) under Ministry of Industry and Trade (MOIT) is implementing the Project “Application of Green Chemistry in Viet Nam to support green growth and reduction in the use and release of POPs/harmful chemicals (Green Chemistry)” funded by GEF/UNDP and with co-financing by Viet Nam agencies/institutions and companies. The project is currently in its first year of implementation.

The project aims to create the enabling environment for the introduction of Green Chemistry in Viet Nam and introduce Green Chemistry applications in productive sectors with the purpose of reducing the use and release of chemicals controlled under Stockholm and Minamata Conventions. The project also expects to result in a reduction in the use and release of chemicals of concern not covered under the MEAs, as well as improve energy and natural resource efficiency and generate Green House Gas (GHG) release reduction co-benefits in the sectors and industries supported by the project.

The project will reduce the use of Persistent Organic Pollutants (POPs) and release of Unintentional Persistent Organic Pollutants (U-POPs) through the introduction of green chemistry approach in six industrial sectors in Viet Nam: chrome plating, pulp and paper manufacturing, plastic manufacturing, textile, pesticides and solvents. Specific guidance for each sector will be developed, and the green chemistry approach will be streamlined into the relevant legislation. Two industrial facilities from 2 different sectors (out of the above six sectors) will be selected for the practical demonstration of the green chemistry approach. The project is structured in 3 components:

1. Developing the enabling environment for Green Chemistry in Viet Nam;
2. Promote awareness on Green Chemistry and the benefits of the application of Green Chemistry and its guiding principles; and
3. Introduce Green Chemistry approaches into priority sectors and at least 2 entities.

The activities to be carried out under this contract are related to Output 3.1.1. (In-depth GC assessments concluded of priority production / manufacturing sectors.) of the project, which is one of the outputs under project Outcome 3.1 (15 g-TEQ/a of UPOPs releases, 1 tonne of POPs, 0.002 tonnes of mercury reduced and at least 65 tons of CO₂ through the introduction of GC in priority sectors),

Output 3.1.1 concerns the assessment of industrial and production sectors that present opportunities for the introduction of Green Chemistry. Based on the preliminary outcomes achieved during the project preparation phase, the following shortlist of priority sectors for the application of GC principles has been identified:

- 1) **Electro-plating industry**, due to its use of PFOS as etching agent and mist suppressant;

- 2) **Plastic manufacturing industry**, due to its use of deca-BDE (which has the potential to be degraded into POPs-PBDE) as well as PBBs (flame retardant) used in many plastic polymers and due to the use of short chain chlorinated paraffins;
- 3) **The textile industry**, due to the potential release U-POPs into products associated with contaminated raw materials (i.e. dyes), the potential use of PFOS and PFAS for water – repellency purposes, the potential use of deca-BDEs as flame retardant, and the use of chlorine as bleaching agent;
- 4) **The pulp and paper industry**, due to the use of chlorine-based bleaching agents that may result in the secondary formation of chlorinated compounds in the environment (including PCDD/F);
- 5) **The pesticide sector**, due to the continuation of the import and use of some restricted chemicals including POPs, and for the use of mercury in some pesticide or biocide formulations
- 6) **The solvent and paint sector**, due to the use of chlorinated solvents and short chain chlorinated paraffins in paints, as well as the use of mercury in some paint formulations.

For common understanding, green chemistry (GC) is defined as “the design of chemical products and processes that reduce or eliminate the use and generation of hazardous substances “. The green chemistry approach has been standardized in 12 general principles: 1. Prevent waste; 2. Maximize atom economy; 3. Design less hazardous chemical syntheses; 4. Design safer chemicals and products; 5. Use safer solvents and reaction conditions; 6. Increase energy efficiency; 7. Use renewable feedstocks; 8. Avoid chemical derivatives; 9. Use catalysts, not stoichiometric reagents; 10. Design chemicals and products to degrade after use; 11. Analyse in real time to prevent pollution; 12. Minimize the potential for accidents¹.

Studies undertaken as part of this output will allow for the establishment of baselines and identify opportunities for green chemistry introduction on a sector-based approach. Assessment results will be presented in sector-specific reports.

The baseline situation and potential for implementation in the 6 industrial sectors which will be covered under the Green Chemistry project are reported in Annex I

UNDP, the GEF Implementation Agency for this project, is seeking an international consultant to provide technical assistance, guidance, training and supervision to the Vietnamese national consultancy firm recruited with a separate TOR to undertake assessment the above mentioned six targeted industrial sectors.

2) OBJECTIVES OF THIS ASSIGNMENT

The objectives of the assignment are to provide technical support, guidance, training and supervision to a Vietnamese consultancy firm and national consultants.

The consultancy firm to be supported has been recruited to undertake in-depth GC assessment of the six targeted industrial sectors in order to select two facilities (out of the six targeted industries) for demonstration of the green chemistry. The national consultants to be supported has been recruited to undertake to select two factories and to prepare demonstration plans for those two selected factories as well as develop criteria for POPs/mercury baseline assessment and calculations of POPs/mercury baseline and reduction.

3) SCOPE OF WORK

Under this assignment, the consultant is expected to provide technical support, guidance, training and supervision to a Vietnamese consultancy firm and national consultants to facilitate the completion and ensuring the quality of the following tasks: 1) site visits in a relevant number of factories / plants for each of the six targeted industrial sectors (textile, plastic, pulp and paper, electro-plating, pesticide and solvent), 2)

¹ Anastas, P. T.; Warner, J. C. Green Chemistry: Theory and Practice, Oxford University Press: New York, 1998, p.30.

assessment of data gathered during site surveys, and drafting of survey and sector reports; 3) selection of 2 demonstration facilities and development of Green Chemistry demonstration plans for these facilities / factories; 4) criteria for POPs/mercury baseline assessment and calculation of POPs/mercury baseline and reduction of the above six sectors.

For this purpose, the international consultant will work in close coordination and cooperation with the national consultancy firm and national consultants.

4) TASKS

The International consultant will perform the following tasks:

Task 1: Support national consultancy firm to undertaking survey of the six industrial sectors

- 1) Provide assistance to the consultancy firm in the drafting of the work-plan for the activity, including the plan for the 48 site visits in industrial sites;
- 2) Provide training to the Vietnamese consultancy team on the implementation of Green Chemistry in the 6 sectors of textile, plastic, electro-plating, pulp and paper, solvent and pesticides, before starting the site visits to the industrial sites. More specifically, the training should be addressed at:
 - a. Analysis of the production processes for the six sectors;
 - b. Criteria for the assessment of POPs use and release, and compliance with Green Chemistry principle at baseline.
 - c. Methodology for studying the Chemical profile of factories (simplified mass balances, type and amount of chemicals and raw material used in the production process, with CAS code) with specific reference to the use / release of POPs, mercury and other POPs/PTSs;
 - d. Methodologies for conducting waste inventory;
 - e. Methodologies for the assessment of energy profile of industrial plants;
 - f. Techniques and equipment for environmental monitoring in industrial sites (online monitoring of stack flue gas, periodical sampling of effluents, etc.);
 - g. Methodologies for the assessment and reduction of water consumption.
- 3) Introduce, as part of the training, a template report to be used for reporting the outcome of the site survey at the industries in a consistent and standardised manner;
- 4) Lead and conduct the site visit of at least 2 out of the 8 manufacturing plants to be visited by the Vietnamese consultancy from each sector (total of 12 site visits). The factories to be visited will cover both Small and Medium Enterprises (SMEs) and largescale plants. During each visit, the expert group (the team of the selected Vietnamese national consultancy plus the international consultant) will discuss with the plant managers the possible GC interventions for the sector in order to raise awareness and collect advice on the practical application of these interventions.
- 5) Provide assistance to the consultancy in the drafting of the site visit reports and revise the site visit reports;

Task 2: Provide assistance to the consultancy firm the preparation of sectoral assessment reports and in the selection of demonstration plants

- 1) Guiding the national consultancy team to assess data collected during the field surveys of the targeted industrial sectors, identify gaps/shortcomings against GC principles and propose possible interventions for each sector to implement at least some of the Green Chemistry principles in its production process;
- 2) Review the sectorial report drafted by the Vietnamese consultancy for each of the 6 sectors examined, which will contain a proposal for a number of possible interventions for each sector to implement at least some of the Green Chemistry principle in the production process.

Task 3: Provide support to the national consultants to prepare a Green Chemistry demonstration plan for two selected plants

- 1) Provide support and advice on the selection of two plants for the demonstration of Green Chemistry.
- 2) Provide assistance to the Vietnamese consultancy in drafting the implementation plan for the demonstration of Green Chemistry in two plants / factories. This support may include advice on required modification of the production process, substitution of hazardous (POPs, PTS, mercury) chemicals with safer ones, or both.
- 3) Provide guidance on the methods for monitoring of the demonstration process as well as methods for calculation of the chemicals/POPs/mercury used and released, GHGs emissions and energy savings, after the implementation of GC approaches in comparison with the baseline, should be also supported by the international consultant and included in the demonstration plan

Task 4: Criteria for POPs/mercury baseline assessment and calculation of POPs/mercury baseline and reduction of the above six sectors

- 1) Provide support and advice to national consultants on the development of criteria for POPs/mercury baseline assessment for each sector.
- 2) Provide support and advice to national consultants on the methodology to calculate POPs/mercury baseline and reduction

5) METHODOLOGY:

The selected consultant will propose and discuss with UNDP and MOIT the approach in undertaking the assignment. The detailed assignment plan will be submitted and approved by UNDP and the PMU before commencing the assignment.

6) DURATION OF ASSIGNMENT, DUTY STATION AND EXPECTED PLACES OF TRAVEL

Duration and Timing: 50 working days during the period from December 2018– July 2019 including two missions to Hanoi and project provinces.

Duty station: Home based with travel to Hanoi, and other provinces in Vietnam.

The international consultant will have two missions, 10 days each mission to Viet Nam (at PMU office in Hanoi and project provinces). Travel cost to project provinces will be paid separately by PMU based on the UN-EU cost norms.

7) FINAL PRODUCTS

The consultants shall deliver the following:

No.	Type of deliverables	Deadline
1	Detailed workplan of the assignment	Two weeks upon the signing of the contract
2	Training material and guidelines for the site visit (inspection) in 6 industrial sectors with the purpose to assess Green Chemistry implementability	30 December 2018
3	Templates for the site visits (inspection) in 6 industrial sectors	30 December 2018
4	Revision of the sectorial reports developed by the consultancy with proposal for the implementation of Green Chemistry by sector	28 February 2019
5	Criteria for POPs/mercury baseline assessment for each sector	30 December 2018
6	Calculations of POPs/mercury baseline and reduction	30 March 2019
7	Revision of the implementation plan for the demonstration of Green Chemistry in two industrial facilities	30 June 2019

8) PROVISION OF MONITORING AND PROGRESS CONTROLS

Coordination and reporting. The selected international consultant will coordinate with PMU staff and the UNDP Programme Officer with regular consultation and guidance by the MOIT.

Technical support and supervision. The selected international consultant will support and supervise the activity of the Vietnamese consultancy, by specifically providing experience on POPs and green chemistry. Therefore, the international consultant shall coordinate all activities with the Vietnamese consultancy, and will also provide specific training for the execution of specific tasks to be carried by the Vietnamese consultancy out under their assignment.

Administrative support will be provided by the PMU/MOIT and UNDP

9) DEGREE OF EXPERTISE AND QUALIFICATIONS

The international consultant should have knowledge, skills and experience as follows:

- Postgraduate or higher education degree in chemistry, industrial chemistry, chemical management/ application, bio-chemistry, hazardous waste management, environmental management and policy, or related fields;
- At least 5 years of practical working experience in development field, with specific experience on environmental management, chemical and waste management in industrial processes, management of hazardous and toxic chemical including POPs/PTSs and Mercury;
- At least 7 years of cumulative experience gathered in at least 3 of the following areas: energy saving in industrial processes, management of POPs, management of hazardous chemicals and hazardous waste, environmental monitoring of industrial processes (including the development of monitoring plans), sampling of waste and environmental media, handling of waste and hazardous substances;
- Knowledge of the use of chemicals in industrial processes with specific reference to two or more sectors among the six targeted industrial sectors;
- Good understanding and knowledge of MEAs (especially Stockholm Convention on POPs, Minamata Convention on Mercury, Basel Convention)
- Good understanding of POPs/mercury baseline assessment and calculation;
- Fluent in written and spoken English (with submission of at least two sample reports)

10) PAYMENT TERMS

- The first instalment of 10% contract amount will be paid upon submission of the detail assignment plan agreed by the UNDP, PMU/MOIT;
- The second instalment of 40% contract amount will be paid upon completion of the first mission to Viet Nam with submission deliverables 2, 3, 5, with satisfactory acceptance by UNDP and MOIT/PMU,
- The last payment of 50% will be paid upon the completion of the second mission to Viet Nam and all products required by the assignment, with satisfactory acceptance by UNDP and MOIT/PMU.

ANNEX I: ANALYSIS OF GC POTENTIAL IMPLEMENTATION IN THE 6 INDUSTRIAL SECTORS IN VIETNAM

Table 1 Electro-Plating Sector - Green Chemistry interventions capable to reduce the use and releases of POPs.

Green Chemistry principle	Situation in the Chrome Plating industry in Viet Nam	Potential GC intervention	Relevance to POP
1. Prevent waste:	Waste slug and wastewater containing POPs and toxic metal are a common issue of the Chrome Plating Industry in Viet Nam.	Increase the number of closed-loop processes to prevent the release of contaminants in wastewater, including PFOS. Ensure rinse water is treated before release. Improve waste treatment processes. Reduce CrVI to CrIII before discharge.	Yes, direct
2. Maximize atom economy:	Most small scale chrome-plating plants use basic processes without automated control of bath conditions.	Reduce/optimize the use of etching agents. Adopt Direct Current (DC) rectifiers and automated control of the chromium bath to reduce the loss of the plating agent (chromium).	Yes, direct
3. Design less hazardous chemical syntheses:	Chrome plating processes making use of PFOS as etching agent and mist suppressant.	Use alternative non-PFOS mist suppressant -see below	Yes, direct
4. Design safer chemicals and products:	N/A	N/A	N/A
5. Use safer solvents and reaction conditions:	PFOS based mist suppressants used for the prevention of chrome-contaminated mists in the workplace.	Use non chemical mist-suppressants (like poly-propylene floating balls) or non PFOS mist suppressants. Introduce alternative chrome-plating processes (under development: trivalent chromium, spray and PVD coatings).	Yes, direct
6. Increase energy efficiency:	Most chrome-plating small-scale plants use basic processes without process control to reduce energy consumption.	Introduce process control to reduce energy use for heating baths (e.g. insulation of plating baths to prevent energy losses).	Yes, indirect (U-POPs)
7. Use renewable feedstocks:	N/A	N/A	N/A
8. Avoid chemical derivatives:	N/A	N/A	N/A
9. Use catalysts, not stoichiometric reagents:	Sulfuric acid mostly used as catalytic agent	Use of less toxic, more balanced, mixtures of catalysts to reduce toxicity of the bath.	No
10. Design chemicals and products to degrade after use:	N/A	N/A	N/A
11. Analyse in real time to prevent pollution:	No real-time monitoring of effluent implemented in most of the small scale plants	Real time monitoring of air and wastewater effluents.	Yes, indirect
12. Minimize the potential for accidents:	Airborne release of chromic acid in the workplace is one of the major causes of worker illness. However, the use of PFOS as mist suppressant introduces a new source of risks in case of non-closed loop processes.	Use of non-chemical mist suppressant like poly-propylene floating balls on the bath surface. Use of chromic acid scrubbers.	Yes, direct

Table 2 Plastic manufacturing sector - Green Chemistry measures and prevention of POPs use and releases.

GC category	Situation in the polymer industry In Viet Nam	Potential GC interventions	Relevance to POP
1. Prevent waste:	Waste from polymer production may contain flame-retardants.	Better control of waste effluent. Reuse/recycle plastic wasted during manufacturing.	Yes, direct
2. Maximize atom economy:	Optimization of processes in a few advanced factories.	Improvement of the polymerization process. Reduce the amount of additives through optimized processes.	Yes, direct
3. Design less hazardous chemical syntheses:	Deca-BDEs are still being imported and used as additives in a number of plastic polymers.	Replace brominated flame retardants with non-brominated non-POPs flame-retardants.	Yes, direct
4. Design safer chemicals and products:	Deca-BDEs are not produced in Viet Nam.	Restrict / control the import of deca-BDE in the country.	Yes, direct
5. Use safer solvents and reaction conditions:	Deca-BDEs are still imported and incorporated as part of a number of plastic polymers.	Improve design of articles so that Flame Retardants are not necessary (introduce alternative measures to reduce fire risk).	Yes, direct
6. Increase energy efficiency:	Adoption of energy saving measures is currently very limited.	Reduce heating through better process control and insulation of reactors.	Yes, direct
7. Use renewable feedstocks:	The plastic sector in Viet Nam often recycles plastic without checking for the content of PBDEs.	Introduce quality criteria for plastic manufacturing, including the use of recycled plastic.	Yes, direct
8. Avoid chemical derivatives:	Not relevant for this type of industry	Not relevant for this type of industry	N/R
9. Use catalysts, not stoichiometric reagents:	Not relevant for this type of industry	Not relevant for this type of industry	N/R
10. Design chemicals and products to degrade after use:	No biodegradable plastics are being produced in Viet Nam.	Production of bio-degradable/bio-plastics, which may prevent the release of U-POPs as a result of accidental combustion.	Yes, direct
11. Analyze in real time to prevent pollution:	Few plants are adopting real time monitoring.	Real time monitoring of air and wastewater effluents introduced.	Yes, indirect
12. Minimize the potential for accidents:	Storage of hazardous chemicals may represent a potential risk.	Improve the storage of hazardous chemicals, by optimizing and reducing the quantities stored, and by establishing surveillance.	Yes, indirect

Table 3. Textile sector - Green Chemistry measures and prevention of POPs use and releases.

GC category	Situation in the polymer industry in Viet Nam	Potential GC intervention	Relevance to POP
1. Prevent waste:	Waste from polymer production may contain flame retardants.	Quality management of incoming fibers. Better control of waste effluent. Avoid processing fibers contaminated with hazardous chemicals, such as pesticides, unless an analytical certificate has been provided. Optimize water consumption and online control of wastewater quality.	Yes, direct and indirect
2. Maximize atom economy:	Optimisation of processes has only been introduced in a few advanced factories.	Improve the quality and quantity of chemicals used, including regular revision and assessment of the recipes, optimal scheduling in production, etc.	Yes, direct
3. Design less hazardous chemical syntheses:	PFOS or PFAS may be used in the finishing process to provide water-repellent features to the fibers.	Replace PFOS and PFAs with other water-repellent substances. Replace PBDEs flame retardants with other FR substances. Build a database of the chemicals and mixtures used in the textile sector to facilitate the identification of alternatives.	Yes, direct
4. Design safer chemicals and products:	PFOS or PFAS are not produced in Viet Nam.	Restrict/control the import of PFOS and PFAS substances in the country. Restrict/control the import of PBDEs flame retardants in the country. Adopt Hydrogen Peroxide bleaching as a substitute of Sodium Hypochlorite bleaching.	Yes, direct
5. Use safer solvents and reaction conditions:	PFOS are still used in a number of textile application. No data is available on the use of PBDEs.	Identify / develop alternative to PFOS as water - repellent substances. Identify / develop alternatives to PBDEs as flame retardants.	Yes, direct
6. Increase energy efficiency:	The adoption of energy saving measures is very limited.	Reduce heating through better process control and insulation of vessels.	Yes, indirect (U-POP)
7. Use renewable feedstocks:	The textile sector already makes wide use of natural fibers.	Introduce quality criteria for natural fibers, including verification of organic residues. Perform testing of intermediate and final products to verify the presence of hazardous substances.	Yes, direct and indirect
8. Avoid chemical derivatives:	Not relevant	Not relevant	Not Relevant
9. Use catalysts, not stoichiometric reagents:	N/A	N/A	Not Available
10. Design chemicals and products to degrade after use:	Many substances used are not biodegradable and are released in the environment during / after manufacturing processes.	Promote the use of surfactants that may easily degrade after release without forming toxic metabolites. Use of non-PFOS antifoaming agents. Develop bio dyes for the replacement of toxic dyestuff	Yes, indirect and direct
11. Analyse in real time to prevent pollution:	Most plants are of small scale and do not adopt real time monitoring.	Real time monitoring of air and wastewater effluents. Adopt automated control of process parameters (e.g. temperature, liquor level, chemicals feed) to reduce the use of chemicals and auxiliaries.	Yes, indirect
12. Minimize the potential for accidents:	Storage of chemicals, including bleaching substances, represent a substantial risk.	Improve the storage of hazardous chemicals, by optimizing and reducing the quantities stored, and by establishing surveillance.	Yes, direct and indirect

Table 4. Pulp and Paper Sector - Green Chemistry measures and prevention of POPs use and releases.

GC category	Situation in the pulp and paper industry In Viet Nam	Potential GC intervention	Relevance to POP
1. Prevent waste:	Poor recycling of the lignin residue from pulping results in a very high organic load released to wastewater, which when associated with high chlorine content (derived from chlorine bleaching) results in a high level of chlorinated compounds released to wastewater.	Improve recycling of lignin from the wastewater process. Improve wastewater treatment. Assess and implement water reuse in various processes.	Yes, indirect
2. Maximize atom economy:	Optimisation of processes has only been introduced in a few advanced factories.	Improve the recycling of lignin before bleaching may lead to a reduction of chemicals needed for bleaching.	Yes,, indirect
3. Design less hazardous chemical syntheses:	Very often there little knowledge about chemicals used. PFOS or PFAS may be used in the finishing process to provide water-repellent features to the paper.	Build a database of chemicals used in the pulp and paper sector to increase awareness. Replace PFOS and PFAS with other water-repellent substances.	Yes, direct and indirect
4. Design safer chemicals and products:	PFOS or PFAS are not only being produced in Viet Nam.	Restrict/control the import of PFOS and PFAS substances in the country. Adopt Hydrogen Peroxide bleaching or ozone bleaching as a substitute to Sodium Hypochlorite bleaching.	Yes, direct and indirect
5. Use safer solvents and reaction conditions:	PFOS is still used in a number of water or grease repellent paper applications.	Identify / develop alternatives to PFOS as water -repellent substances.	Yes, direct
6. Increase energy efficiency:	Adoption of energy saving measures is very limited.	Reduce heating through better process control and insulation of vessels.	Yes, indirect (U-POPs)
7. Use renewable feedstocks:	Pulp and paper is made from natural fibers, however deforestation and sustainability of plantations for the pulp and paper industry remains an issue.	Introduce quality criteria for natural fibers, including verification of organic residues. Test the final product for the presence of chemical residues, including POPs.	Yes, direct and indirect
8. Avoid chemical derivatives:	Not relevant.	Not relevant.	N/R
9. Use catalysts, not stoichiometric reagents:	Only applicable to large plants.	Using a solid metal catalyst and a hydrogen peroxide solution as an 'activator' to kill microorganisms by oxidation.	N/R
10. Design chemicals and products to degrade after use:	Paper is mostly biodegradable, However it may contain additives or trace chemicals, which are persistent or not easily biodegradable.	Develop a database of chemicals used in the pulp and paper industry. Test final product for the presence of POPs and other hazardous substances.	Yes, direct and indirect
11. Analyse in real time to prevent pollution:	Most plants are small scale and have not adopted real time monitoring.	Real time monitoring of all process modules. Real time monitoring of air and wastewater effluents. Adopt automated control of process parameters (e.g. temperature, liquor level, chemicals feed) to reduce applied chemicals and auxiliaries.	Yes, indirect
12. Minimize the potential for accidents:	Storage of chemicals including acid tanks and chlorine may represent a serious risk in the pulp and paper sector.	Improve the storage of hazardous chemicals, optimizing and reducing the quantities stored, and establishing surveillance.	Yes, direct and indirect

Table 5. Solvent and Paint Industry - Green Chemistry measures and prevention of POPs use and releases

GC category	Situation in the solvent and bio-solvent industry in Viet Nam	Potential GC intervention	Relevance to POP / mercury
1. Prevent waste:	N/A	N/A	
2. Maximize atom economy:	N/A	N/A	
3. Design less hazardous chemical syntheses:	The petro-chemical industry and the chlor-alkali process, produce most of the solvents used in Viet Nam.	Firms manufacturing non-harmful bio-solvents are emerging. Promote the development of industries in the bio-solvent sector.	Yes, direct and indirect
4. Design safer chemicals and products:	The use of chlorinated and halogenated solvents is widespread in industrial processes. Some solvents produced by the petro-chemical industry (BTEX series) are also commonly used and known for their toxicity. SCCP are used in the formulation of paints.	Design solvents, which can replace halogenated solvents or BTEX solvents commonly used in products. Redesign paint mixtures to avoid the use of SCCP.	Yes, direct and indirect
5. Use safer solvents and reaction conditions:	N/A	N/A	
6. Increase energy efficiency:	N/A	N/A	
7. Use renewable feedstocks:	As the petro-chemical industry and the chlor-alkali process produce most of the solvents used in Viet Nam, feedstocks are non-renewable. A limited number of firms are currently investing in bio-solvents.	Production of solvents from the distillation of vegetable, renewable feedstock.	No – however reduce GHG
8. Avoid chemical derivatives:	N/A	N/A	
9. Use catalysts, not stoichiometric reagents:	N/A	N/A	
10. Design chemicals and products to degrade after use:	Chlorinated solvents and aromatic solvents are usually hard to degrade. Most of the solvents used in Vietnamese industry are imported chlorinated or aromatic solvents. Some paint formulation are still based on the use of SCCP.	Develop the production and promote the use of bio-degradable solvents to replace chlorinated, non-degradable solvents. Develop the production of paints not containing SCCP.	Yes – direct and indirect
11. Analyse in real time to prevent pollution:	N/A	N/A	
12. Minimize the potential for accidents:	N/A	N/A	

Table 6. Pesticide Production and Application - Green Chemistry measures and prevention of POPs use and releases

GC category	Situation of the pesticide production and application in Viet Nam	Potential GC intervention	Relevance to POP / mercury
1. Prevent waste:	As in many other countries, the issue of pesticide waste containers is serious and not addressed yet.	Reduce the amount of pesticide containers. Ensure that after use containers are not dumped in the environment.	
2. Maximize atom economy:	Pesticides are not manufactured in Viet Nam. In most cases pesticides are re-formulated.	Promote the use of bio-pesticides. As bio-pesticides are synthesized by living organisms, the promotion of their use will ensure maximum atom economy in their synthesis.	Limited – indirect
3. Design less hazardous chemical syntheses:	As historically demonstrated, the design of pesticides is linked to the production and release of many POPs as intermediate substances or impurities in the final product.	Replace the production of traditional pesticides with bio-pesticides, as the biosynthesis of pesticide is intrinsically safe and extremely efficient.	Yes – indirect relevance
4. Design safer chemicals and products:	Most pesticides are imported in Viet Nam.	Bio pesticides - although in some cases they may be very effective like conventional pesticides - in general do not exhibit the properties of POPs and are biodegradable. In Viet Nam, 49 bio-pesticides have been registered as active ingredients, however these are in the early stages of commercialisation. Promoting the use of bio-pesticide would limit the use of conventional pesticides including POPs pesticides.	Yes - Indirect
5. Use safer solvents and reaction conditions:	No specific action in Viet Nam has been taken to introduce the use of safer solvents in pesticide production.	Promote the use of bio-solvents in the formulation of bio pesticides.	Yes – indirect
6. Increase energy efficiency:	Synthetic chemistry may require high energy processes.	The active ingredients of bio-pesticides have been synthesized by plants. Energy may be required for extraction – concentration. Promoting the use of bio-pesticides would limit the use of energy as compared to the manufacturing of synthetic pesticides.	No
7. Use renewable feedstocks:	Most pesticides are synthetic pesticides manufactured abroad.	Bio-pesticides are always extracted from natural, renewable materials.	No
8. Avoid chemical derivatives:	Most pesticides are synthetic pesticides manufactured abroad.	Not relevant	No
9. Use catalysts, not stoichiometric reagents:	Most pesticides are synthetic pesticides manufactured abroad.	Not relevant	No
10. Design chemicals and products to degrade after use:	Most pesticides are synthetic pesticides manufactured abroad. Some of the synthetic pesticides recently imported in Viet Nam are designed to ensure biodegradability.	Bio-pesticides are normally biodegradable, therefore do not exhibit POPs characteristics.	Yes
11. Analyse in real time ...	N/A	N/A	
12. Minimize the potential for accidents:	N/A	As bio-pesticides are generally biodegradable, accidental releases would be easier to remediate.	Indirect

ANNEX IV

OFFEROR'S LETTER TO UNDP

CONFIRMING INTEREST AND AVAILABILITY FOR THE INDIVIDUAL CONTRACTOR (IC) ASSIGNMENT

Date _____

(Name of Resident Representative/Bureau Director)

United Nations Development Programme

(Specify complete office address)

Dear Sir/Madam:

I hereby declare that:

- A) I have read, understood and hereby accept the Terms of Reference describing the duties and responsibilities of [*indicate title of assignment*] under the [*state project title*];
- B) I have also read, understood and hereby accept UNDP's General Conditions of Contract for the Services of the Individual Contractors;
- C) I hereby propose my services and I confirm my interest in performing the assignment through the submission of my CV which I have duly signed and attached hereto as Annex 1;
- D) In compliance with the requirements of the Terms of Reference, I hereby confirm that I am available for the entire duration of the assignment, and I shall perform the services in the manner described in my proposed approach/methodology which I have attached hereto as Annex 3 [*delete this item if the TOR does not require submission of this document*];
- E) I hereby propose to complete the services based on the following payment rate: [*please check the box corresponding to the preferred option*]:
 - ☐ An all-inclusive daily fee of [*state amount in words and in numbers indicating currency*]
 - ☐ A total lump sum of [*state amount in words and in numbers, indicating exact currency*], payable in the manner described in the Terms of Reference.
- F) For your evaluation, the breakdown of the abovementioned all-inclusive amount is attached hereto as Annex V;
- G) I recognize that the payment of the abovementioned amounts due to me shall be based on my delivery of outputs within the timeframe specified in the TOR, which shall be subject to UNDP's review, acceptance and payment certification procedures;
- H) This offer shall remain valid for a total period of _____ days [*minimum of 90 days*] after the submission deadline;
- I) I confirm that I have no first degree relative (mother, father, son, daughter, spouse/partner, brother or sister) currently employed with any UN agency or office [*disclose the name of the relative, the UN office employing the relative, and the relationship if, any such relationship exists*];

J) If I am selected for this assignment, I shall *[please check the appropriate box]:*

- ☐ Sign an Individual Contract with UNDP;
- ☐ Request my employer *[state name of company/organization/institution]* to sign with UNDP a Reimbursable Loan Agreement (RLA), for and on my behalf. The contact person and details of my employer for this purpose are as follows:

K) I hereby confirm that *[check all that applies]:*

- ☐ At the time of this submission, I have no active Individual Contract or any form of engagement with any Business Unit of UNDP;
- ☐ I am currently engaged with UNDP and/or other entities for the following work:

Assignment	Contract Type	UNDP Business Unit / Name of Institution/Company	Contract Duration	Contract Amount

- ☐ I am also anticipating conclusion of the following work from UNDP and/or other entities for which I have submitted a proposal:

Assignment	Contract Type	Name of Institution/ Company	Contract Duration	Contract Amount

L) I fully understand and recognize that UNDP is not bound to accept this proposal, and I also understand and accept that I shall bear all costs associated with its preparation and submission and that UNDP will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the selection process.

M) *If you are a former staff member of the United Nations recently separated, please add this section to your letter:* I hereby confirm that I have complied with the minimum break in service required before I can be eligible for an Individual Contract.

N) I also fully understand that, if I am engaged as an Individual Contractor, I have no expectations nor entitlements whatsoever to be re-instated or re-employed as a staff member.

O) Are any of your relatives employed by UNDP, any other UN organization or any other public international organization?

YES ☐ NO ☐ If the answer is "yes", give the following information:

Name	Relationship	Name of International Organization

P) Do you have any objections to our making enquiries of your present employer?

YES ☐ NO ☐

Q) Are you now, or have you ever been a permanent civil servant in your government's employ?

YES ☐ NO ☐ If answer is "yes", WHEN?

R) REFERENCES: List three persons, not related to you, who are familiar with your character and qualifications.

Full Name	Full Address	Business or Occupation

S) Have you been arrested, indicted, or summoned into court as a defendant in a criminal proceeding, or convicted, fined or imprisoned for the violation of any law (excluding minor traffic violations)?

YES ☐ NO ☐ If "yes", give full particulars of each case in an attached statement.

I certify that the statements made by me in answer to the foregoing questions are true, complete and correct to the best of my knowledge and belief. I understand that any misrepresentation or material omission made on a Personal History form or other document requested by the Organization may result in the termination of the service contract or special services agreement without notice.

DATE: _____

SIGNATURE: _____

NB. You will be requested to supply documentary evidence which support the statements you have made above. Do not, however, send any documentary evidence until you have been asked to do so and, in any event, do not submit the original texts of references or testimonials unless they have been obtained for the sole use of UNDP.

Annexes *[please check all that applies]:*

☐ CV shall include Education/Qualification, Professional Certification, Employment Records /Experience

☐ Breakdown of Costs Supporting the Final All-Inclusive Price as per Template

GUIDELINES FOR CV PREPARATION

WE REQUEST THAT YOU USE THE FOLLOWING CHECKLIST WHEN PREPARING YOUR CV:

Limit the CV to 3 or 4 pages

NAME (First, Middle Initial, Family Name)

Address:

City, Region/State, Province, Postal Code

Country:

Telephone, Facsimile and other numbers

Internet Address:

Sex, Date of Birth, Nationality, Other Citizenship, Marital Status

Company associated with (if applicable, include company name, contact person and phone number)

SUMMARY OF EXPERTISE

Field(s) of expertise (be as specific as possible)

Particular development competencies-thematic (e.g. Women in Development, NGOs, Privatization, Sustainable Development) or technical (e.g. project design/evaluation)

Credentials/education/training, relevant to the expertise

LANGUAGES

Mother Tongue:

Indicate written and verbal proficiency of your English:

SUMMARY OF RELEVANT WORK EXPERIENCE

Provide an overview of work history in reverse chronological order. Provide dates, your function/title, the area of work and the major accomplishments include honorarium/salary.

References (name and contact email address) must be provided for each assignment undertaken by the consultant that UNDP may contact.

UN SYSTEM EXPERIENCE

If applicable, provide details of work done for the UN System including WB. Provide names and email address of UN staff who were your main contacts. Include honorarium/salary.

UNIVERSITY DEGREES

List the degree(s) and major area of study. Indicate the date (in reverse chronological order) and the name of the institution where the degree was obtained.

PUBLICATIONS

Provide total number of Publications and list the titles of 5 major publications (if any)

MISCELLANEOUS

Indicate the minimum and maximum time you would be available for consultancies and any other factors, including impediments or restrictions that should be taken into account in connection with your work with this assignment.

ANNEX V

FINANCIAL OFFER

Having examined the Solicitation Documents, I, the undersigned, offer to provide all the services in the TOR for the sum of (USD for International Consultant)

This is a lump sum offer covering all associated costs for the required service (fee, meal, accommodation, travel, taxes etc).

Cost breakdown:

No.	Description	Quantity	Unit Rate (USD)	Total
1	Consultancy fee			
2	Out of pocket expenses			
2.1	Travel			
2.2	Per diem			
2.3	Full medical examination and Statement of Fitness to work for consultants from and above 65 years of age and involve travel – (required before issuing contract).			
2.5	Others (pls. specify).....			
	TOTAL			

** Individual Consultants/Contractors who are over 65 years of age with assignments that require travel and are required, **at their own cost**, to undergo a full medical examination including x-rays and obtaining medical clearance from **an UN-approved doctor** prior to taking up their assignment.*

I undertake, if my proposal is accepted, to commence and complete delivery of all services specified in the contract within the time frame stipulated.

I agree to abide by this proposal for a period of 120 days from the submission deadline of the proposals.

Dated this day /month of year

Signature

(The costs should only cover the requirements identified in the Terms of Reference (TOR) Travel expenses are not required if the consultant will be working from home).