# CLEANER PRODUCTION AND APPLICATION IN THE VIETNAM PETROLEUM INDUSTRY

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**Summary**

*Cleaner Production (CP) was first introduced in Vietnam in 1995 by the United Nations Environmental Programme (UNEP). According to UNEP, CP is the continuous application of an integrated preventive environmental strategy to processes, products, and services in order to increase efficiency and reduce risks to humans and the environment. The demonstration case studies have figured out that CP can give the opportunities to reduce from 10 - 15% of energy and input material consumption in production. CP brings about not only economic benefit but also environmental one to help improve production efficiency of both big and small companies.*

*This paper introduces the concepts, methodology and benefits of Cleaner Production, its application and practice in the Vietnam National Oil and Gas Group.*

***Key words:*** *Cleaner Production, CP, waste minimisation, emissions, initiatives.*

## 1. Cleaner Production Concept

Cleaner Production (CP) was first introduced in Vietnam by the United Nations Environmental Programme (UNEP) in 1995. According to UNEP, CP is the continuous application of an integrated preventive environmental strategy to processes, products, and services in order to improve ecological productivity and reduce risks to humans and the environment.

Accordingly, CP for products includes reducing negative impacts during the whole life cycle of a product, from design to its disposal. For production processes, CP includes material and energy conservation, toxic material elimination and reduction of the quantity and toxicity of all wastes at source. For services, CP is to incorporate environmental concerns into designing and delivering services.

The objective of CP is to avoid pollution by utiliszing resources, materials and energy with the highest efficiency. Thus, a certain additional proportion of materials and energy which ought to be discarded will be converted into finished products. Therefore, CP not only brings economic benefits to companies, but also helps protect the environment.

Basically, CP is similar to "Waste Minimisation", "Pollution Prevention" or "Green Productivity". However, the approach and methodology of each concept are different.

CP brings economic benefits and reduces waste through pollution prevention measures, which are different from end-of-pipe waste treatment measures. With these benefits, CP is an important step for companies to establish and apply the Environmental Management System ISO 14000.

## 2. Cleaner Production Methodology

To implement CP, we have to conduct CP assessment. CP assessment is a series of activities conducted to identify options that can bring efficiency to production. The CP assessment often focuses on answering the following questions:

- Where waste and emissions are generated;
- Why waste and emissions are generated;
- How waste and emissions can be minimised and eliminated in the company.

CP assessment is a systematic approach to investigate the existing production process and identify opportunities to improve the process or products.

A CP assessment process is divided into 6 steps: (1) Getting started; (2) Analysing process steps; (3) Generating CP options; (4) Selecting CP options; (5) Implementing CP options; (6) Maintaining CP. These steps are divided into 18 specific tasks (Figure 1).

CP implementation is a journey rather than a destination, when a CP assessment is finished, other assessments will be started to improve current conditions or continue with other selected options. CP does not specify limits but requires continuous improvement from a company.

### 3. Cleaner Production benefits

CP brings not only economic benefits but also environmental one, and is of great significance for a company; especially the industrial companies, whether small or big. The case studies have showed that most companies have the potential to reduce from 10 - 15% of energy and input material consumption.

Benefits brought by CP include:

- Improved production efficiency;
- More efficient utiliszation of raw materials, water and energy;
- Recovery of valuable by-products;
- Less pollution;
- Lower costs for waste disposal and waste water treatment;
- Improved image for companies;
- Improved safety and occupational health.

### 4. Cleaner Production application in Vietnam

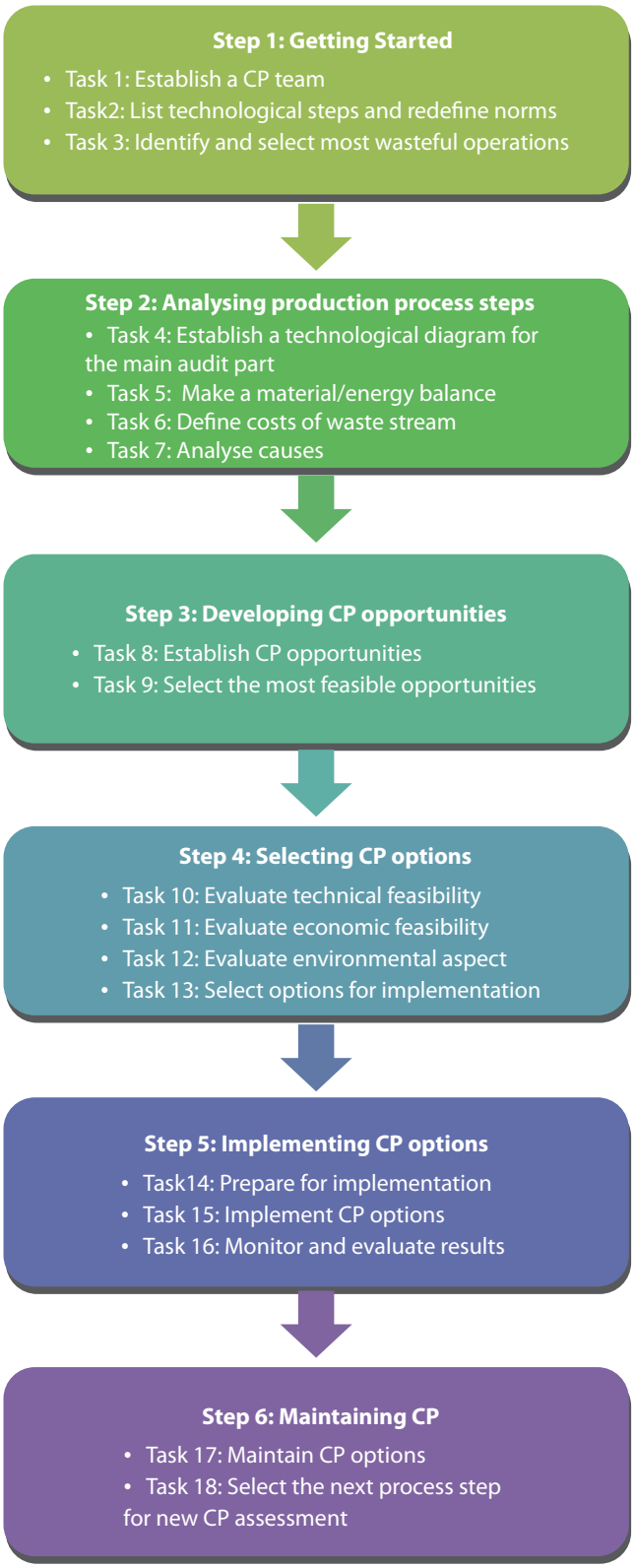
On 22 September 1999, the Minister of Science, Technology and Environment (now the Minister of Science and Technology), on behalf of the Government of Vietnam, signed the International Declaration on Cleaner Production.

In view of the economic and environmental benefits that CP brings about, on 7 September 2009, the Prime Minister signed Decision No. 1419/QD-TTg approving the Cleaner Production Strategy in the Vietnamese Industry to the year of 2020; in which sets the targets by 2015:

- 50% of the industrial companies are aware of the CP benefits in the industrial production;
- 25% of the industrial companies apply CP; the CP applied industrial companies save from 5 - 8% of energy, fuel and raw material consumption per unit of product.

And by the year of 2020:

- 90% of industrial companies are aware of the CP benefits in the industrial production;
- 50% of the industrial companies apply CP; the CP applied companies save from 8 - 13% of energy, fuel and raw material consumption per unit of product;
- 90% of the medium and large companies have established a specialised body responsible for CP.




To implement the Prime Minister's Decision No. 1419/QD-TTg, the Ministry of Industry and Trade has promulgated directives to guide the provincial Departments of Industry and Trade and the industrial companies to develop and implement the Action

Programme on Cleaner Production in order to achieve the targets of the Strategy for Cleaner Production approved by the Prime Minister. According to the statistics on the Ministry of Industry and Trade's website on Cleaner Production, many provinces and cities in Vietnam have been promoting CP application in their industrial sectors. In Hanoi, 54 enterprises have applied CP, of which 16 enterprises have reduced the fuel and raw material consumption per unit of product by over 5%.

CP application is bringing practical benefits to various industrial sectors such as brewery industry, tea processing, leather and footwear, paper and pulp; plastic recycling, steel industry; and building materials, etc.

**5. Cleaner production application in the Vietnam petroleum industry**

Thoroughly aware of the economic and environmental benefits that CP brings about, the Vietnam Oil and Gas Group (PVN), in implementing the guidelines of the Ministry of Industry and Trade, has developed and approved the Action Plan for implementing the Cleaner Production Strategy in Industry toward the year of 2020 by Decision No. 9702/QD-DKVN dated 31 December 2013. PVN's Action Plan has set the targets:

By the year of 2015:

- 50% of the enterprises under PVN having the CP potential shall be aware of the CP benefits;

- 25% of the enterprises under PVN having the CP potential shall apply CP in their production and shall save the energy and material consumption from 3 - 5%;

- 25% of the enterprises under PVN shall have CP staff;

- 70% of the CP responsible staff of PVN will be trained and capable to disseminate, guide, consult and support the CP application in their enterprises.

And from 2016 to 2020:

- 100 % of the enterprises under PVN having the CP potential shall be aware of the CP benefits;

- 50% of the enterprises under PVN having the CP potential shall apply CP in their production and shall save the energy and material consumption from 5 - 8%;

- 50% of the enterprises under PVN shall have CP staff;

- 100 % of the CP responsible staff of PVN will be trained and capable to disseminate, guide, consult and support the CP application in their enterprises.

PVN's CP Action Plan also figures out 6 specific tasks and pinpoint the measures to successfully implement the tasks and the entire plan.

However, since the CP Action Plan was approved by the PVN's President and CEO, the implementation has been behind the planned schedule. Up to now, one of the Action Plan's most important tasks - basic and advanced training for CP staff from PVN affiliates - has not been started yet. Besides objective reasons and the capability of the unit which was appointed as the implementing body of the Plan, there are also subjective reasons which come from some of the PVN functional divisions, as well as the inefficient internal co-ordination.

Although the basic and advanced training courses to provide a more systematic and professional methodology for CP have not really been launched yet, many industrial enterprises under PVN, such as Binh Son Refining and Petrochemical Company Limited (BSR), Petrovietnam Fertilizer and Chemicals Corporation (PVFCCo), and PetroVietnam Camau Fertilizer Company Limited (PVCFC) have been very interested in saving raw materials and energy consumption, as well as, reducing emissions into the environment through technical innovations and systematic application of initiatives. Every year, engineers of these enterprises have generated hundreds of initiatives, bringing about the savings of billion VND. In 2012, only 5 industrial enterprises under PVN generated and applied 319 initiatives, bringing about the savings of 394 billion VND in the first year of application. In 2013, 302 initiatives in PVN's enterprises saved in total 1,703 billion VND in the first year of application. Many initiatives already applied in PVN's affiliates are in fact a type of cleaner production practice in the Vietnam petroleum industry.

While the survey data for CP assessment of each enterprise under PVN is unavailable, the number of measures registered and the initiatives recognised and applied every year suggest that the potential for CP application inside the PVN's industrial enterprises is huge. The CP application, as demonstrated above, obviously will not only bring practical economic and environmental benefits but also help improve the image for a strong PVN brand among the community. Thus, the CP application is

an objective demand inside PVN and its affiliates, and also a requirement from the Government and the Ministry of Industry and Trade to successfully implement Decision No. 1419/QD-TTg approved by the Prime Minister. What remains is awareness.

In the coming period, the Vietnam National Oil and Gas Group is to determine to boost the implementation of its CP Action Plan, considering it a measure among others to be resolutely deployed by PVN to reduce costs and improve the efficiency of production and business in the context of unpredictable crude oil price decline; and a contribution to the environmental protection and sustainable development of PVN as set out by its Development Strategy.

**References**

1. Vietnam Cleaner Production Centre - Hanoi University of Science and Technology. *Cleaner Production guidelines for SMEs.*

2. Prime Minister. *Decision approving the "Cleaner Production Strategy in Industry toward the year of 2020"*. Decision No. 1419/QD-TTg dated 7 September 2009.

3. Vietnam Oil and Gas Group. *Decision approving and issuing the Action Plan for implementing the Cleaner Production Strategy in Industry toward the year of 2020 of the Vietnam Oil and Gas Group*. Decision No. 9702/QD-DKVN dated 31 December 2013.

4. Ministry of Industry and Trade. http://www.sxsh.vn.