



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Ministry of Planning and
Investment of Vietnam

PROJECT REPORT

Eco-industrial park initiative for
sustainable industrial zones
in Viet Nam 2014-2019



INCLUSIVE AND SUSTAINABLE INDUSTRIAL DEVELOPMENT

DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO. Although great care has been taken to maintain the accuracy of information herein, neither UNIDO nor its Member States assume any responsibility for consequences which may arise from the use of the material.

This document may be freely quoted or reprinted, but acknowledgement is required.
Edited by: Alessandro Flammini and Jerome Stucki, UNIDO

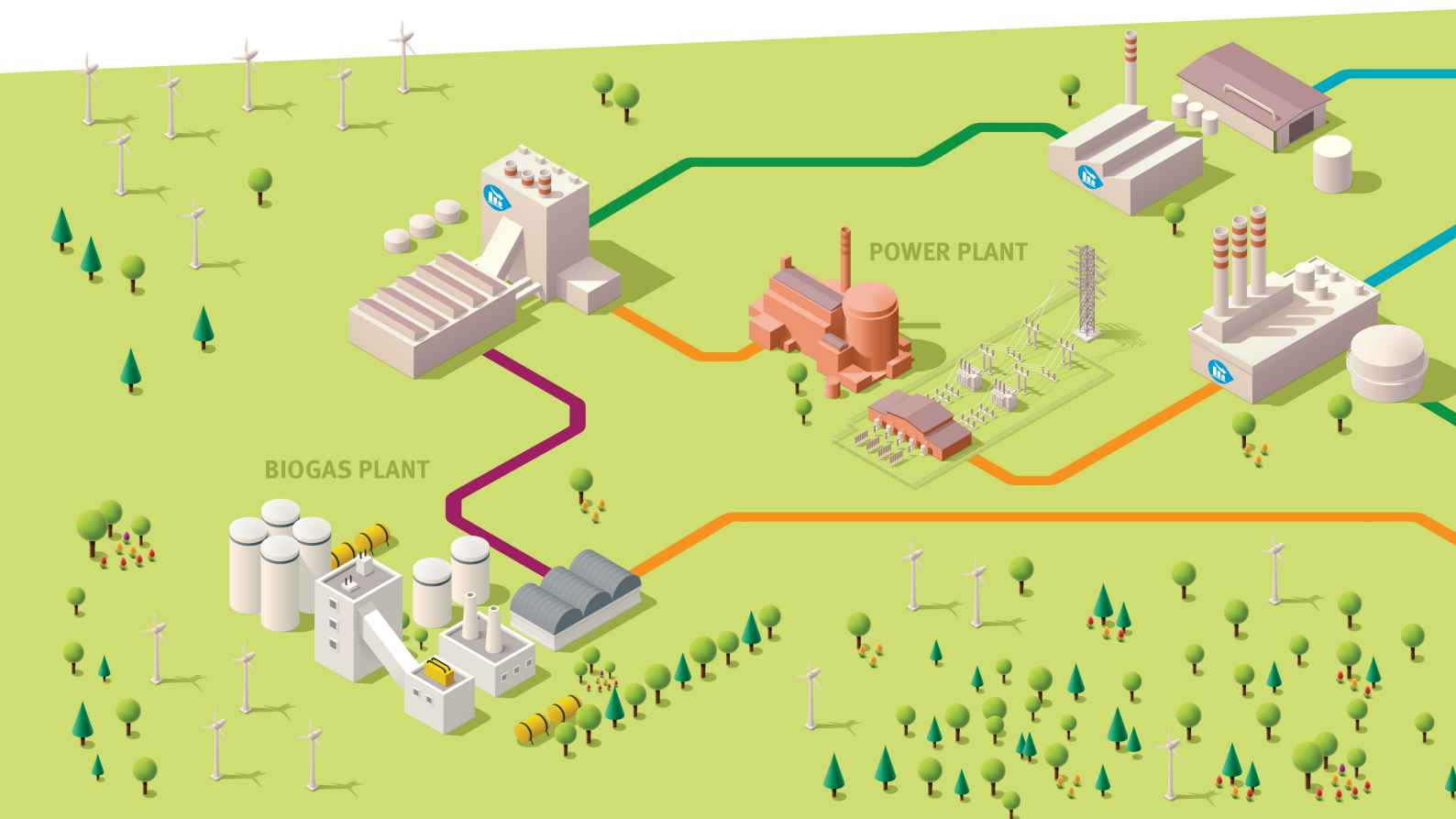
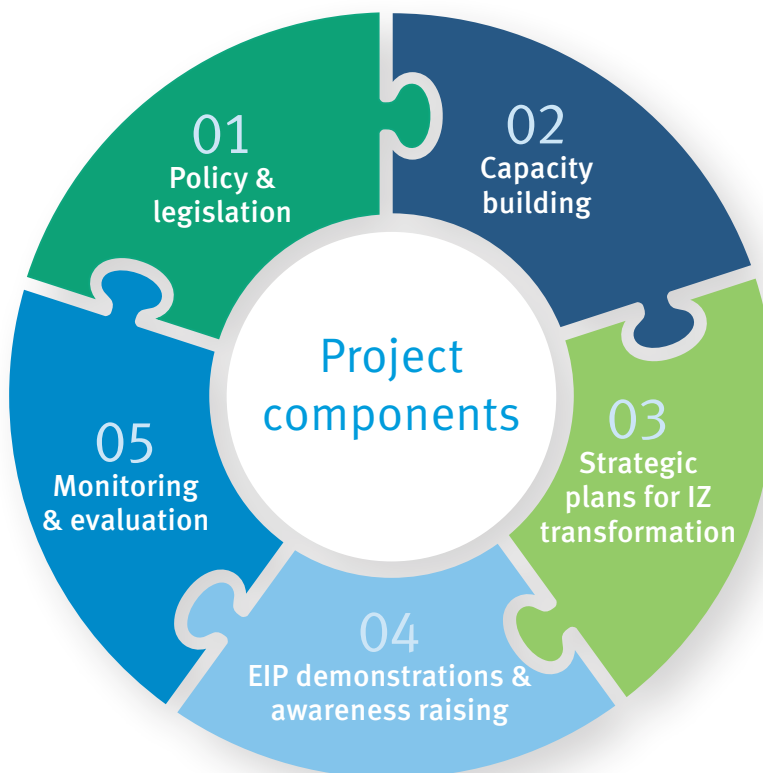
Vienna, 2019.

CONTENTS

1. PROJECT MANAGEMENT	8
Background	8
Project design	9
Project components	10
Project management structure	10
Grant and co-financing	11
Project Indicators and achievement	11
Conclusions	16
2. AWARENESS AND CAPACITY BUILDING FOR EIP MANAGEMENT AT THE CENTRAL, PROVINCIAL AND PARK LEVELS	17
3. IDENTIFICATION AND TRANSFER OF TECHNOLOGY AND BUSINESS MODELS CONDUCTIVE TO EIPS	18
4. FINANCING FOR RECP, IS, AND EIP INVESTMENTS	21
5. CAPACITIES TO ADDRESS COMMUNITY CONCERNS REGARDING ENVIRONMENTAL ACCIDENTS AND POLLUTION	22
6. POLICY AND REGULATORY CONDITIONS SUPPORTIVE TO ECO-INDUSTRIAL PARKS.	24
7. SUSTAINABILITY OF PROJECT IMPACTS	25
8. PROJECT MONITORING	26
9. LESSONS AND RECOMMENDATIONS	27



Eco-Industrial Park Vietnam

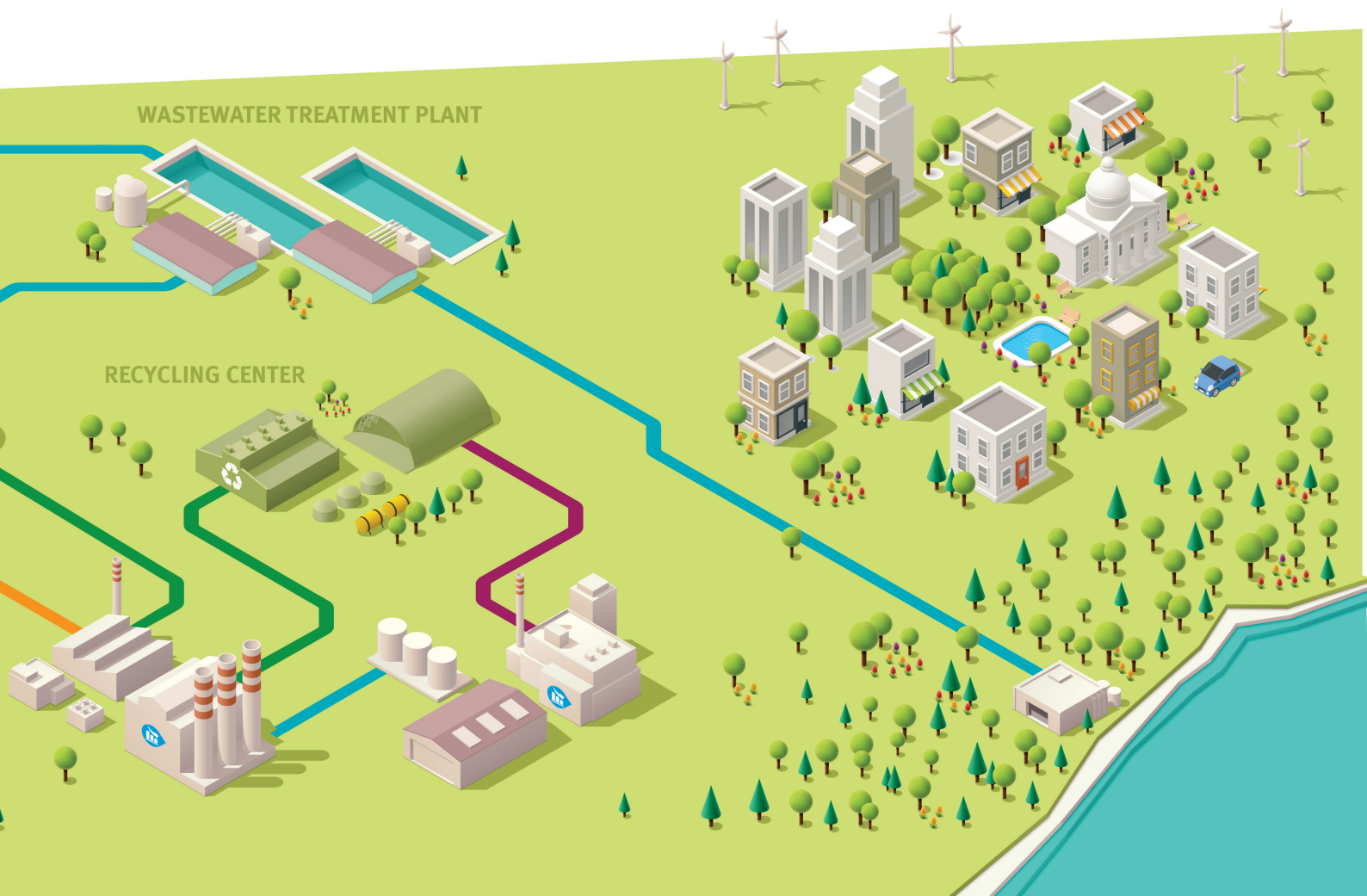


Project in Brief

Project objective: the project, implemented by the Ministry of Planning and Investment (MPI) and the United Nations Industrial Development Organization (UNIDO) in 2014-2019, aimed at increasing transfer, deployment and diffusion of clean and low-carbon technologies, minimization of greenhouse gas (GHG) emissions, persistent organic pollutants (POPs) and water pollutants as well as improving water-efficiency and sound management of chemicals.

The project promoted and supported the gradual transformation of industrial zones into eco-industrial parks. In parallel, it also raised enterprise awareness on making optimum use of natural resources, minimizing environmental pollution, while providing positive socio-economic benefits to workers and communities nearby.

Four industrial zones were targeted across Viet Nam: Khanh Phu & Gian Khau (in Ninh Binh province), Hoa Khanh (Da Nang) and Tra Noc 1&2 (Can Tho).



Implemented by



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Executed by



Ministry of Planning and
Investment of Vietnam

Funded by



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
State Secretariat for Economic Affairs SECO



Key National Stakeholders

- Ministry of Planning and Investment (MPI)
- Ministry of Science and Technology (MOST)
- Ministry of Natural Resources and Environment (MONRE)
- Ministry of Industry and Trade (MOIT)
- Vietnam Environment Protection Fund (VEPF)
- Vietnam Development Bank (VDB)

Benefits for participating companies and park managers

- ✓ Improved resource efficiency through the reduction of the use of raw materials, water and energy
- ✓ Reduced production costs
- ✓ Improved competitiveness and profitability
- ✓ Minimized GHG emissions, release of UOPs and use of toxic chemicals
- ✓ Reduced waste through the promotion of Cleaner Production and the 3 R's (Reduce, Reuse and Recycle)
- ✓ New and more employment opportunities
- ✓ Improved workers' health and safety as well as quality of life of communities
- ✓ Better access to new technologies and financial instruments

Four targeted industrial parks from three provinces



Hanoi

Ninh Binh

Danang

Can Tho

Environmental benefits from resource
efficient and cleaner production
(RECP) interventions and from
industrial symbiosis (IS)

Total over investments lifetime*	Target at project entry
2,901,681 t	1,273,000 t
225,354 kg/y	76,900 kg/y
8,115,999 m³/y	6,000,000 m³/y
20,262 µg/y	810,000 µg/y
669,774 t	--

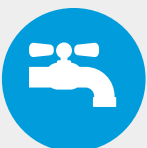
CO₂ eq



COD reduction



Water use reduction



UPOPs



Solid waste



Implementation of RECP
recommendations by 56 tenant
companies (76 companies involved)

Total RECP recommendations	758	100%
Implemented and maintained	676	89%
Planned for implementation	33	4%
Still under consideration	19	3%
Unlikely to be implemented	30	4 %

Implementation of industrial symbiosis
recommendations by tenant companies

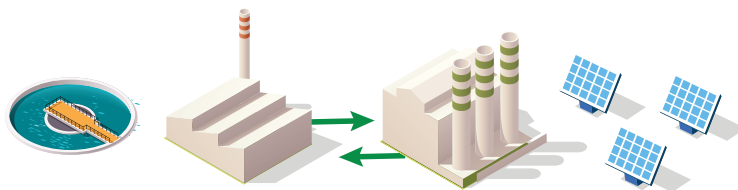
Companies surveyed	137	
Companies with IS opportunities identified	61	
Companies with IS opportunities studied	18	100%
Companies with committed IS investments	12	67%
IS opportunities under / up for implementation	10	39 %
IS opportunities already implemented	2	11%

*assuming a replication factor of 3 for RECP
implemented options only. It includes
pipeline investments.

Awareness and capacity building for EIP management at the central, provincial and park levels

The project approach was to simultaneously support capacity development for eco-industrial park (EIP) management at central, provincial, park, enterprises and academic levels. Project workshops, capacity building activities and other events reached around 3,000 persons in total in Hanoi and in the three targeted provinces. The project steering committee

(PSC) meetings were also used to disseminate information and promote feedback and exchanges among the different stakeholders. This approach was key to develop a shared understanding of the EIP opportunities across the selected regions and their public administrations, enterprises, and related stakeholders.



Industrial park assessments undertaken

(Photovoltaic, co-processing; wastewater management)

3



Participants trained

2360



International study tour

2



Events organized
(national / provincial)

38



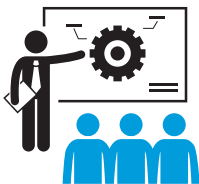
Publications

20



Experts recruited

40



Expert group meetings (2)

140 participants



Industrial symbiosis studies prepared

18



International EIP training course for decision makers

17 participants



Enterprises involved

76



Provinces targeted

3

1. Project management

Background

UNIDO started conversations with the government of Viet Nam on the project in 2010. At this time, Viet Nam had experienced ten years of rapid economic growth driven mainly by the processing and manufacturing sectors. Viet Nam's economic reforms and macroeconomic management since 1990 had led to a gross domestic product (GDP) growth that averaged about 7 percent per year. To facilitate the emergence of new industries by 2013, the government had established 173 industrial zones (IZ) with an average of 90 companies in each zone. During project development, basic environmental legislation was in place but insufficient regulations and enforcement capacity had done little to halt environmental degradation. Provincial authorities, under strong competition to attract investors to IZ, were often lenient in the enforcement of environmental standards. Similarly IZ authorities minimized fees charged to companies for infrastructure services. Approximately 70% of effluents from industrial zones was directly discharged without prior treatment affecting agriculture and aquaculture, and causing severe pollution of surface and groundwater as well to the marine ecosystems. Untreated solid waste in industrial zones with a high proportion (20%) of hazardous material was also on the rise. These conditions negatively affected human health and degraded the environment. The fast-paced economic development also contributed to a high consumption of natural gas, electricity, and especially coal resulting in a rapid increase of GHG emissions.

In response to this situation, the Vietnamese government had by 2013 started a series of broad programs, not restricted to IZ, to optimize industrial processes and introduce environmental controls. Viet Nam is a party to the Stockholm Convention from its beginning made the reduction and elimination of POPs releases a national priority. Thus, the government had adopted laws and regulations prohibiting the production and use of all POPs pesticides. The government had also received

multiple grants and support from the GEF, the European Commission, the Danish International Development Agency (DANIDA) and other donors to address issues related to industrial pollution. During project preparation, UNIDO was implementing a global program on RECP and had been active in Viet Nam since 1996. UNIDO had also helped to launch the VNCPC in 1998 which by 2013 had grown to a national center of excellence recognized by national and international stakeholders.

During project preparation, UNIDO identified four key barriers to environmental sound management of chemicals and wastes in companies and in IZs in Viet Nam:

- Lack of knowledge in companies and service providers of clean and low-carbon technology and practices, including optimization strategies;
- Lack of awareness about alternative financial sources for investments in environmentally friendly technologies, such as the Swiss Green Credit Trust Fund or the Viet Nam Environment Protection Fund (VEPF);
- Lack of public economic incentives and confidence in the recycling economy and company cooperation within the IZ;
- Little enforcement of environmental legislation, unclear responsibility among authorities, lack of relevant expertise in the IZ management boards, and a lack of conditions and guidelines for the transformation of IZ into EIPs.

GEF approved the project in December 2013 as a first multifocal area project in the areas of climate change, international waters and POPs. Subsequently, the project went through an approval process within the Government of Viet Nam, and officially started in May 2015. An extension was granted in September 2017, and the project closed in June of 2019.

Project design

The main objective of the project is “to increase transfer, deployment and diffusion of clean and low-carbon technologies and practices for the minimization of GHG emissions, POPs releases and water pollutants as well as improved water-efficiency and the sound management of chemicals in industrial zones (IZ) of Viet Nam.”

Expected Outcomes:

- Legislation and policies on IZ planning and management, IZ environmental and industrial pollution management, responsibilities and investment facilitation for clean & low-carbon technology adopted to meet EIP criteria;
- Strengthened institutional capacities on eco-industrial park planning and management at central and provincial government level and IZ authorities in selected provinces;
- Strengthened capacities on technology transfer, including clean & low-carbon technologies and resource-efficient and safe practices at company level in the selected IZ and government level;
- Potential for clean & low-carbon technologies and resource-efficient technical solutions identified, and community enhancement projects clarified;
- EIP projects to reduce GHG, water consumption, water contaminants and unintentionally produced POPs demonstrated, and community enhancement initiated;
- Increased public awareness on issues concerning EIP development; and,
- Effective project management, monitoring, and evaluation implemented.

The project originally comprised demonstrations only in three industrial zones. It was subsequently extended to four industrial zones in three provinces after the mid-term review: Khanh Phu and Gian Khau in the northern province of Ninh Binh, Hoa Khanh in the central province of Danang and Tra Noc 1 & 2 in the southern city of Can Tho.

Project components

The project contributed to the following necessary conditions for the transformation to eco-industrial parks:

- Awareness and sufficient capacity for EIP management at the central, provincial and park levels;
- Identification and transfer of technology and business models conducive to EIPs;
- Capacity to address community concerns regarding environmental accidents and pollution;
- Policy and regulatory conditions supportive to eco-industrial parks; and
- Financing for RECP, industrial symbiosis, and EIP investments.

Project management structure

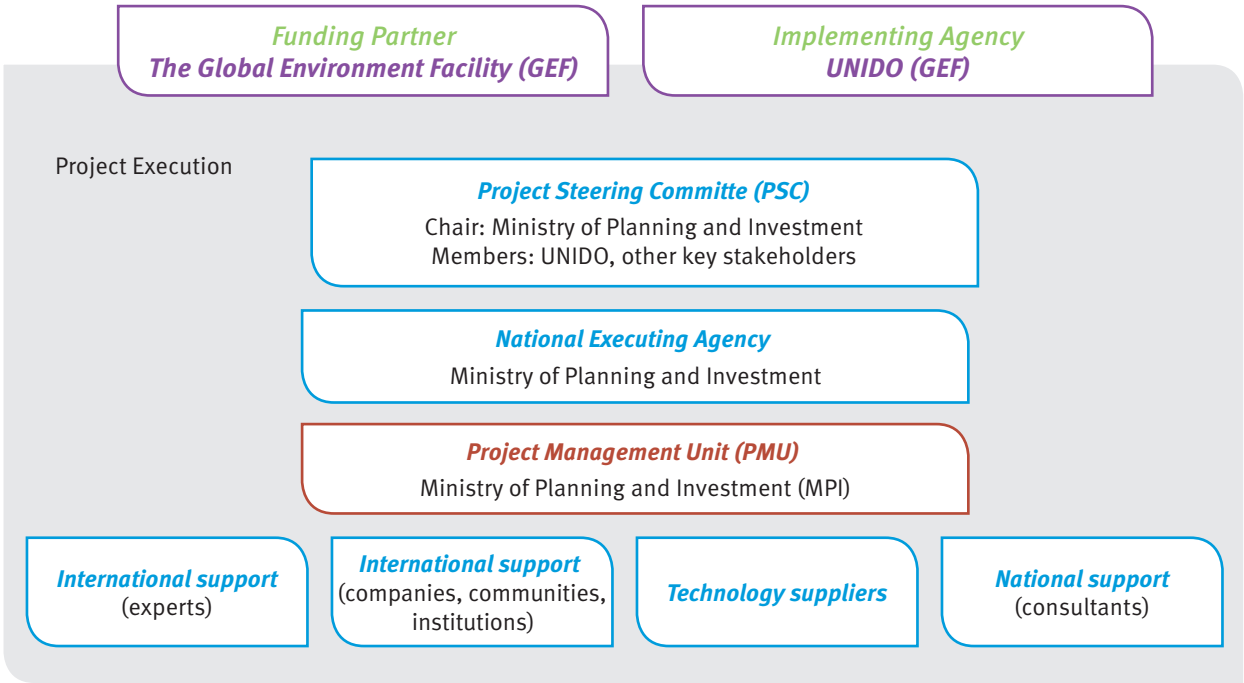
UNIDO was responsible for the implementation of the GEF-funded project. The selection of sub-contractors occurred in line with UNIDO’s rules and regulations and consultation with the Vietnamese government. The Ministry of Planning and Investment (MPI) was responsible for coordination with other participating ministries and agencies in executing the project. Other important participating ministries included:

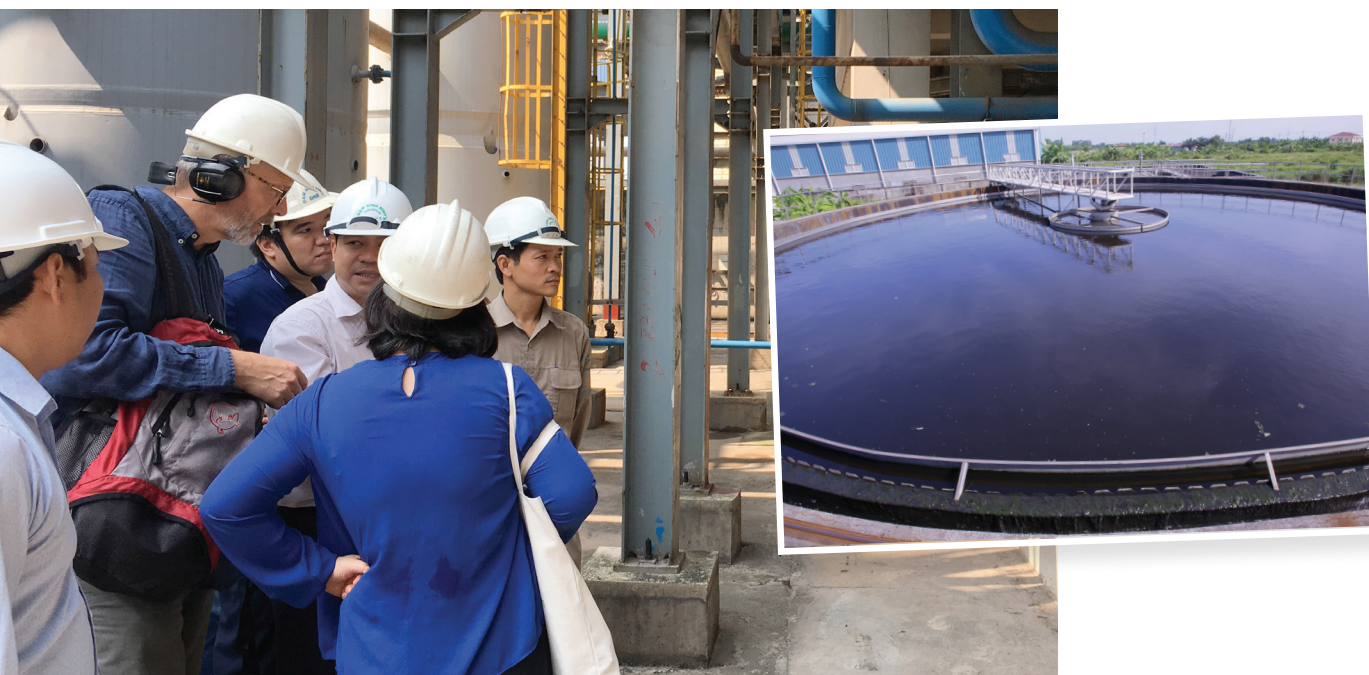
- The Ministry of Natural Resources and Environment (MONRE) to address issues related to regulations and policies on environmental management of IZ and sustainable production;
- The Ministry of Industry and Trade (MOIT) addressed institutional capacity building on IZ development and strengthening regulatory and policy frameworks;

- The Ministry of Science and Technology (MOST) supported the project on issues related to the technology innovation and application program.

A Project Steering Committee (PSC) ensured good coordination and collaboration among the participating ministries, provincial and city authorities, park management boards, community representatives, and other stakeholders. PSC was chaired by MPI and composed of representatives from MONRE, MOIT, MOST and the Ministry of Finance (MOF), representatives from the three selected provinces and their respective Provincial People’s Committees (PPC), representatives from the industrial zones management boards and IZ surrounding communities, and the National Project Director (NPD) and the UNIDO Project Manager.

The Project Management Unit (PMU) was responsible for the overall project execution on behalf of the PSC and in coordination with MPI and UNIDO.





Grant and Co-financing

At project approval, the GEF CEO endorsed a grant for USD 3,524,000 for an implementation period of 3 years which was subsequently extended to 4.5 years (including six months inception phase) after a mid-term review. At the time of CEO endorsement, several ministries, provinces, and funds in Viet Nam, the State Secretariat of Economic Affairs (SECO) of Switzerland and UNIDO committed co-financing for a total amount of USD 49,597,265. This resulted in overall project commitments of USD 53,121,265.

As for national co-financing, a total of USD1,800,000 of in-kind and USD 47,797,265 in cash were committed at CEO endorsement mostly from the People's Committee of the three provinces of the targeted industrial zones (Danang, Can Tho, and Ninh Binh), the Viet Nam Environment Protection Fund (VEPF), the Green Credit Trust Fund (GCTF) of SECO, the Viet Nam Development Bank (VDB), the Ministry of Industry and Trade (MOIT) and other ministries. Co-funding commitments at CEO endorsement also included USD 1 230 000 from SECO and UNIDO.

The total co-financing commitments realized during the project accounted to USD 38,776,483.

Funds provided by the GEF and SECO were programmed to support processes leading to policy reforms, institution and capacity development, and to studies to identify opportunities for RECP, industrial symbiosis and industrial zone strategic services and investments. The co-financing by provincial governments was mostly destined to pilot demonstrations and investments and to finance capacity-building activities in the respective ministries.

Project Indicators and Achievement

Awareness and capacity building for EIP management at the central, provincial and park levels. Awareness-raising and capacity development were key features of the project and went hand in hand. The project approach was to simultaneously support capacity development for EIP management of central, provincial, and park authorities, enterprises, and academicians. Project workshops and

capacity building activities reached more than 2,300 persons in Hanoi and in the three provinces. The PSC meetings were also used to disseminate information and promote feedback and exchanges among the different participating entities. This approach was key to develop a shared understanding of the EIP opportunities across the different regions, levels of public administration, enterprises, and other stakeholders.

Identification and transfer of technology and business models conducive to EIPs. The project supported the development of capacities in Viet Nam to identify, test, and transfer technologies for the transition to EIPs. The project demonstrated three approaches to identify opportunities for the promotion of cleaner production and more efficient use of resources.

- The project supported 73 enterprises in the identification of more 730 opportunities of Resource Efficient and Cleaner Production (RECP), 96% of which were implemented or in the process of implementation at the time the project closed in June 2019.
- The project developed in-depth assessments and feasibility studies for 18 industrial symbiosis opportunities in Can Tho and Da Nang. By the time the project closed, 12 such opportunities were implemented, or enterprises were committed to their implementation. These opportunities either took place between two or more companies or at the scale of the industrial zone.
- The project developed a study for the introduction of co-processing waste in cement plants in the province of Can To. Co-processing is a technology by which cement kilns are adapted to process solid waste as fuel. The project also financed studies for the introduction of photovoltaic energy generation using rooftops in Da Nang and Ninh Binh, and did a simple proposal for a rooftop photovoltaic (PV) option in an individual company in Can Tho. The project also

proved the feasibility of individual PV systems and developed studies on the wastewater treatment needs in the four targeted IZs.

Capacities to address community concerns regarding environmental accidents and pollution. As production activities in the IZs expanded, the uncontrolled pollution that affected the well-being of IZ surrounding communities also increased. The community's initial response was to report these incidents to district authorities. When responses from the authorities did not come or were slow, the communities took action such as blocking the entrance of the IZ or stopping trucks from using rural roads. The project sought to provide for alternative solutions by developing communication channels between the communities, industrial zone management boards, and the authorities. In addition, the project developed a handbook and trained community representatives on readiness and response to accidents, and on how to identify conditions in which accidents could take place.

Policy and regulatory conditions supportive to eco-industrial parks. The project had a key role in supporting the preparation of Decree 82, which defines inter alia the conditions and requirements for the recognition as EIP in Viet Nam. The main role of the project was to demonstrate the feasibility and benefits of EIPs in Viet Nam, and to demonstrate the multiple benefits of resource-efficient and cleaner production (RECP), industrial symbiosis (IS) to small and medium enterprises (SME). The project organized study tours for government officials, business leaders, and academics to help them understand the benefits of eco-industrial parks. Two expert group meetings in 2016 and in 2018 allowed experts from Viet Nam and other countries to exchange information, learn from other experience, and to explore the challenges and opportunities in the establishment of eco-industrial parks and the applicability of industrial symbiosis. Through these events, the project provided a stage for Vietnamese key stakeholders to jointly identify successes, challenges and opportunities in their country under given conditions.

The project developed a roadmap for EIP in Viet Nam and also supported the development of environment, social and economic indicators for EIP. This included a detailed overview of monitoring requirements, targets against indicators, and guidelines for the calculation of indicators.

Financing for RECP, IS, and EIP investments. An initial project assumption was a lack of information among SMEs and IZ on how to access finance as the main barrier to SMEs and IZ financing. Thus, early in the implementation process, the project developed guidelines on the requirements of financial institutions in Viet Nam. However by August 2018, none of the enterprises participating in the RECP assessments had accessed financing. Consequently, a lack of finance had prevented the implementation of some of the identified RECP options. The project carried out several activities to address this issue. One of them was to support SMEs to develop funding proposals to financial institutions. By July 2019, only two out of nine proposals that were submitted were approved and one actually funded after eight months of multiple information requests from the financial institution. The project's experience illustrated the difficulties in overcoming the administrative barriers to

SME financing. Unless solutions are found, it is very likely that once low hanging fruits are exhausted, administrative barriers will become a major hurdle as further progress for SME access to financing to be part of EIP.

Environmental benefits

The project met or exceeded most of its environmental targets. Avoidance of CO₂eq emissions considerably surpassed the target. Regarding POPs, the project did not meet its targets because there were few opportunities to implement technologies that would reduce POPs emissions in the IZs where the project operated. The two firms that had significant POPs emissions closed or reduced significantly (50%) operations after the project started for economic reasons independent of the project.

The GHG emission reductions of current RECP innovations (including replication factor of 3) are calculated to 1,005,681 CO₂eq tons per year (t/y). When adding the investments proposed by the project, that were under consideration at project closure by the three provincial governments and other investors, the GHGs reductions comes to a total of 2,901,681 CO₂eq t/y. Three key IZ level investments proposed by the project include photovoltaic

Projected lifetime environmental benefits and targets at project endorsement

Pollutant or resource	Current and approved investments (per year)	Pipeline investments (per year)	Total projected to life of investments	Targets at project endorsement
CO ₂ eq	32,361 t	128,300 t	2,901,681 t	1,273,000 t
COD reduction	75 118 kg	--	225,354 kg/y	76,900 kg/y
Water use reduction	2,705,333 m ³	--	8,115,999 m ³ /y	6,000,000 m ³ /y
UPOPs	6,754 µg	--	20,262 µg/y	810 mg/y
Solid waste	5,750 t	82,440 t	669,774 t/y	--





plants in Tha Noc and Hoa Khan to generate electricity and a co-processing plant in Nigh Binh to treat solid waste. An important barrier for the construction of the two photovoltaic plants is a regulation that limits to 1 MW the amount of electricity that operators can transfer through the grid. The project has underlined this limitation to the government of Viet Nam.

In the case of co-processing, Ninh Binh, like many other rapidly industrialized provinces in Viet Nam, is running out of options to dispose of their solid waste safely. Viet Nam hosts only one licensed cement plant in operation with a permit for co-processing waste. A study commissioned by the project indicates that co-processing presents a technically and economically feasible solution for recovery of most industrial solid waste in Ninh Binh. Co-processing will nonetheless require the shipment of solid waste to a cement plant located in a different province which will require new regulations on transportation and other safety standards, and interprovincial coordination.

The proposed co-processing project in Ninh Binh -when deployed and the reductions of solid waste by RECP innovations- will contribute to the reduction of POPs by preventing disposal of waste material in landfills with uncontrolled burning or by preventing the incineration in old incinerators with limited or no air pollution control devices.

Economic benefits

The project introduced new RECP practices and technologies that, in addition to reducing pollution and waste of resources, also reduced costs, increased income, and improved the enterprises' capacities to compete on the market. From 2016 to 2018, the participating enterprises invested over USD 11 million and achieved a total return of USD 9.6 million per year through adoption of RECP options. The average payback period for investments was seven months. Only six of over 670 opportunities faced a payback time longer than two years.

Investments on RECP opportunities by participating enterprises (2016-2018) USD

Province	RECP Investment	Annual returns
Can Tho	3,257,281	5,403,967
Da Nang	3,213,404	1,959,610
Ninh Binh	4,599,875	2,284,524
Total	11,070,561	9,648,102

In the case of the IS opportunities identified by the project, the total investment required for the implementation of the 18 identified options accounts to USD 4 579 000. By June 2019, USD 2.7 million were already been invested in industrial synergies. The expected returns for these investments accounted to just

over 1 USD million per year, and the average expected payback was of 28 months.

Investments on IS opportunities by participating enterprises (2019)

Province	Capital already invested or committed (USD)	Expected benefit (USD/year)
Ninh Binh	-	
Can Tho	1,745,113	750,655
Da Nang	999,385	412,212
TOTAL	2,744,498	1,162,867

The studies for strategic park level investments also made good business sense. The co-processing plant would require around a 10-Million-USD investment to equip an existing cement plant for co-processing. This investment is considerably smaller than a comparative investment on a land fill or an incinerator. In addition, co-processing is also easier to implement given the likely opposition to land fills and incinerators by residents. It is also a safe option under proper operating conditions. The photovoltaic studies also indicate annual savings of approximately USD 443,100 in Tra Noc and USD 503,400 in Hoa Khanh.

Social Benefits

The incorporation of RECP and IS into the production processes has resulted in less clutter and more organized and cleaner working environment for workers. It has also reduced the risk of accidents in the factory. For example, the RECP study identified a lack of insulation of vapor transmission lines in a paper mill as a source of heat losses. These heat losses significantly increased the costs of production and contributed to higher temperatures in the work environment. A modest investment in the insulation of transmission lines significantly reduced

energy costs while at the same time improving working conditions for operators. Moreover, the improvement of labor conditions has an important gender dimension as 50% to 60 % of the factory workers in the factories are women as well as workers in the production line.

The improved communication between community leaders, enterprises and authorities, through the training and channels of communication introduced by the project are likely to improve the flow of information and resulting in quicker response to environmental accidents. Similarly, the awareness building workshops and posters developed by the project have provided important information to people in the IZ-surrounding communities on environmental risks and actions to prevent accidents. More importantly, the project demonstrated that better communication and information help to prevent accidents and is in the best interest of all concerned.

In addition to the short-term benefits, the broader adoption of RECP and IS, and the implementation of the strategic park scale investments proposed by the project have strong potential towards environmental, economic and social benefits in the long run. The continuous identification and application of practices are not only attractive in terms of business, but also environmentally sound, and address the social needs that are key to the transformation of IZs into EIP. The approach introduced by the project also provides key strategic elements that will allow provincial governments reconcile their development objectives in the industrial and tourism sectors, and prevent environmental accidents while improving opportunities for the local populations.

Conclusions

UNIDO and the PMU managed a total of USD 4,158,789. Project funds were provided by GEF (USD 3,524,000), SECO (USD 753,348) and UNDP (USD 101,441). The project was highly efficient when considering the conversion of money



to environmental benefits. Despite falling short on the POPs target and considering only GHG emission reduction of the investments that have taken place or are highly likely to take place (these are the investments in RECP replication), the cost per t CO₂eq paid by the project was less than one-third of the costs of a t CO₂eq in the market in March 2019.

The project outputs and key capacity development outcomes were fully achieved. These included the training of at least 2,360 people on different aspects of RECP, IS and EIP in 38 events that took place in Hanoi, Hochiminh City and the three provinces, a EIP training course in Switzerland, two expert group meetings and the recruitment of 40 national and international experts and study tours to Europe, Japan and China. The approach the project took in achieving all outputs was also key to ensure that resources build local capacities for the transformation to EIPs. For example, the mixed use of national and international experts was key in the project because it provided country stakeholders with information on how similar challenges are addressed in other countries while at the same time fostered a dialogue on utility adaptation to the conditions in Viet Nam. Ultimately it was the various country stakeholders who decided when and how to adopt technologies and business models.

The project objectives and the achieved results directly supported the implementation of the Vietnamese national Social Economic Development Strategy 2011-20, the Green Growth Strategy for the period 2011-2020 and the related Provincial Development strategies. One of the key objectives of these strategies was the transition to a low carbon economy. The project contributed to this objective by introducing new concepts and testing technologies that not only reduced GHG emissions but also reduced waste and improved the use of natural resources. The project also helped Viet Nam to pave the foundation towards the transition from industrial zones to eco-industrial parks.

One indicator of the relevancy of the project to the country stakeholders is their level of satisfaction with their participation and utility they derived from the project. The project commissioned a survey to assess the levels of satisfaction of project trainees. The project systematically assessed the level of satisfaction of project trainees and received very positive feedback. Enterprises participating in RECP indicated that they were satisfied (40%), happy (46%) or very happy (10%). Participants responded that study tours were either “positive” or “very positive,” and all but three respondents indicated that training was good or very good.

While there is still significant room for improvement in respect to labor and social conditions in IZ, the incorporation of RECP and IS into the production processes resulted in less clutter and more organized and cleaner working environment for workers and have reduced the risk of accidents in factories. The improved communication between community leaders, enterprises, and authorities, the training carried out on preventing environmental accidents, and the channels of communication developed with the help of the project are likely to improve flow of information and to lead to quicker response to environmental accidents.

2. Awareness and capacity building for EIP management at the central, provincial and park levels

At the start of the project, a lack of comprehensive awareness and understanding of the eco-industrial park concept existed in Viet Nam. One of the first activities of the project was consequently to commission a communication strategy that identified the key stakeholders that the project needed to target in the public administrations, enterprises, communities, and academia. The project approach was to simultaneously support capacity development for EIP management at the central, provincial, and park authority administrative, and enterprises and academicians. Project workshops and capacity building activities took place at the central level and in the three parks and provinces. This approach helped develop a shared understanding of the EIP opportunities across the different regions, levels of public administration, enterprises, and other stakeholders.

The integration of awareness-raising, dissemination of knowledge, and capacity building contributed to high adoption rates of IS opportunities. The project also carried out more than 50 workshops in Hanoi and in the three targeted provinces on issues related to EIP management, industrial symbiosis, solid waste management, hazardous chemicals management and water treatment. In total, the project reached over 3,000 people, including representatives from the private companies, provincial governments, industrial zone authorities, central government officials, academia and research institutions, NGOs and IP surrounding communities. The project also established a website which reported on the results of the PSC, meetings, published guidelines and handbooks and provided information on project activities.¹

Furthermore, the project sponsored the participation of 17 key decision makers from different sectors in a course EIPs in Switzerland, and also supported a study tour to

Japan and China as well as a second one to Denmark and Austria where participants could witness firsthand the management of eco-industrial parks. In the case of the EIP course in Switzerland and the study tours, participants from different ministries, provinces, and enterprises had the opportunity to learn and interact with each other in ways that would have been unlikely under other circumstances. The project also organized two expert group meetings in which experts from around the world and from Viet Nam shared their experiences on themes relevant to eco-industrial parks such as policies on- and implementation of cleaner production and industrial symbiosis. The study tours and expert meetings were critical to bring on board high-level decision-makers from MPI and the Viet Nam Academy of Social Sciences and other key entities responsible for policy development and providing technical knowledge to the country's strategic decisions. Key stakeholders from these two institutions, in particular, were initially skeptical. However, thanks to the project were then convinced of the relevance of these approaches to industrial development in Viet Nam. Henceforth, they became the champions in the incorporation of EIP principles into national policies.

These interactions led to a fluid exchange of perspectives among different stakeholders that ultimately resulted in a shared understanding of the challenges and opportunities for action to advance EIPs in Viet Nam. It also strengthened country ownership beyond the main ministerial counterpart.

The first expert group meeting organized by the project in 2016 serves a good example for the efficacy of this approach. Consisting of 140 participants, including officers from MPI, MONRE, six additional central ministries, the provinces, industrial zone management boards and representatives of enterprises, the meeting provided the opportunity for both a multi-stakeholder discussion of key

¹ <https://eipvn.org/>



EIP concepts and for finding key consensus points that were subsequently incorporated into the revision of the national policy to industrial zones in Decree 82.

The project also supported the development of a course on eco-industrial parks especially for universities. In 2018, the project trained 70 persons, including officers, teachers, and managers from the MPI, Institute of Regional Sustainable Development, Viet Nam Economics Institute, and the National Economics University. The faculty of the National Economics University considered that the workshop addressed a knowledge gap in Viet Nam and recommended to develop course on eco-industrial parks management in Graduate Academy of Social Sciences in the Faculty of Sustainable Development.

At the provincial level, the project awareness raising, and capacity building activities helped officials to reconcile environmental and development priorities. Authorities in the three provinces faced the challenge of balancing industrial development with the growing demands for environmental and food safety by the local populations and the emergence of new economic sectors such as tourism. This requires better prevention of environmental accidents and the attraction of clean high value-added industries. One

of the key barriers to attract such industries is the nature of the current model of industrial zone administration that stresses renting land to industry while providing very basic services only. The project collaborated with the three provincial and park administration authorities to find models of park administration to reconcile the different development needs. One of the key lessons derived during the study tours and expert meetings is that in order to attract more businesses, the park needs to provide services that industries value. The project helped to move this agenda forward by conducting assessments pertaining to key park level services.

Nevertheless, important challenges remain. Considering the growing number of IZ in Viet Nam, there is a need to continue building capacities and knowledge among provincial and park authorities, SMEs to access financial resources needed to invest in new technology. Within the same IP, enterprises continue to be reluctant to share data on their production process necessary to identify IS opportunities with park authorities or other companies. There is also a need for regulations to specify conditions in which treated wastewater and solid waste can be exchanged among enterprises.

3. Identification and transfer of technology and business models conducive to EIPs

The project supported the development of capacity to identify, test, and transfer technologies for the transition to EIPs. The project drew of three approaches to identify opportunities that support this technological transition at three different levels. These were Resource Efficient and Cleaner Production (RECP), industrial symbiosis (IS) and strategic studies for industrial park level investments.

Project support to Resource Efficient and Cleaner Production

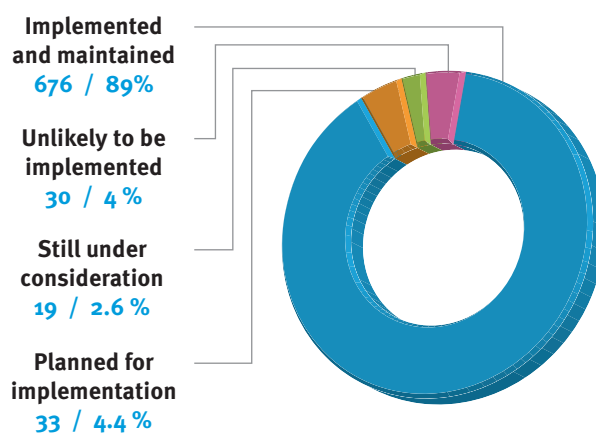
The project applied the RECP approach to identify opportunities for improvement in the production lines within enterprises. UNIDO defines RECP as “the continuous application of preventive environmental strategies to processes, products, and services to increase efficiency and reduce risks to humans and the environment. RECP addresses the three sustainability dimensions individually and synergistically: a) heightened economic performance through improved productive use of resources, b) environmental protection by conserving resources and minimizing industry’s impact on the natural environment, and c) social enhancement by providing jobs and protecting the wellbeing of workers and local communities”².

From June 2016 to December 2018 the project carried out three batches of RECP assessments in 73 enterprises within the selected industrial parks. These assessments identified over 1000 opportunities for RECP that were narrowed down to 758 after a second review. At project closure, 56 enterprises had implemented 676 (89%) of the identified opportunities, 33 (4.4%) of the identified opportunities were under implementation, 19 (2.9%) were

under consideration and only 30 (4%) were reported as unlikely to be implemented. The participating enterprises immediately implemented no or low-cost interventions such as good housekeeping, process control, on-site reuse, and recycle. In the case of the 19 options that were still under consideration, a factor in the decision was lack of access to capital to be invested in equipment upgrading. Many of the 30 opportunities that are unlikely to be adopted pertain to enterprises that had gone out of business, that had been recently acquired by other organizations and were under new management, and that had changed their product lines and made the investments no longer relevant.

Implementation of RECP recommendations by enterprises

Total RECP recommendations 758

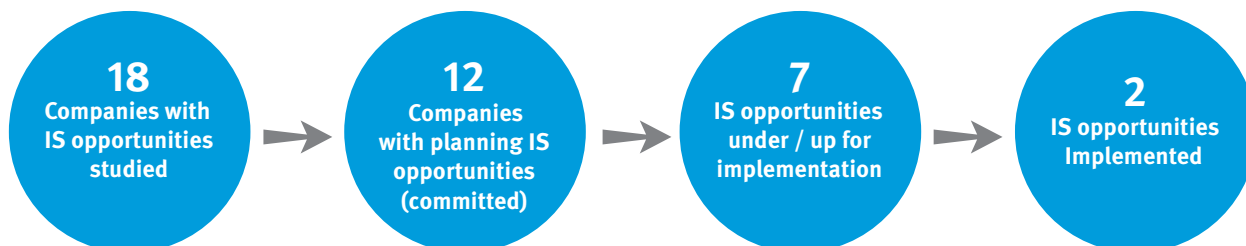


Project support to Industrial Symbiosis

IS is a collaborative pattern among enterprises aimed at improving resource efficiency and creating shared services and infrastructure. The project carried out most

² <https://www.unido.org/our-focus/safeguarding-environment/resource-efficient-and-low-carbon-industrial-production/resource-efficient-and-cleaner-production-recp>

Implementation of industrial symbiosis recommendations by enterprises



of the IS activities during 2018 and 2019. The project developed in-depth assessments and feasibility studies for industrial symbiosis opportunities in Can Tho and Da Nang. Some of these opportunities took place between two or more companies and others at the scale of the industrial zone. The project identified 18 IS opportunities by reviewing the RECP assessments that had been carried out for the 73 enterprises and through a questionnaire sent to over 200 enterprises in the three industrial zones. The project surveyed a total of 137 companies and identified 61 IS candidate interventions. These candidates were assessed based on four criteria: technical feasibility, economic viability, environmental and social aspects, and governance and legal aspects. Subsequently, the project held workshops in the three provinces to hold detailed discussions with SME managers and gather additional information to help fine-tune the feasibility studies. In total, the project trained 167 persons during this process. The project also used these workshops to identify concrete next steps for the implementation of IS. A key consideration during the selection was to secure the commitment of IZ management boards and the targeted enterprises to the further analysis of the IS opportunities, as assessments require considerable information and engagement from the enterprises and IZs.

By May 2019, enterprises had implemented two opportunities, ten were under implementation, and two were planned for implementation. In other words, two-thirds of the opportunities detected have been adopted by stakeholders.

As in the case of the RECP opportunities, there was a high rate of adoption of IS by participating enterprises. However, challenges remained such as a lack of access to financial resources to invest in new technology. This was a key factor affecting the adoption of IS opportunities. Companies were also frequently reluctant to share data on raw materials, energy, and water consumption. Waste data is considered sensitive by some companies. Also, enterprises are sometimes reluctant to make their production process reliant on the operation of other enterprises. In addition, since environmental concerns are often neglected by companies, environmental standards are sometimes not enforced, making some RECP interventions not economically interesting for companies.

Project support to identify strategic investment at the industrial zone scale

One of the key lessons derived by participants during the study tours, and the expert meetings sponsored by the project is that there are many opportunities to improve production by sharing services at the park level. Thus, also supporting efficiencies at the scale of the enterprise, the project also sought opportunities to improve resource use efficiencies and waste management at the scale of the industrial zone. In 2017, the project supported studies in the three IZ to identify the wastewater content to more precisely develop water treatment strategies. The project also financed studies for the introduction of more



efficient technologies that could be implemented at the park scale.

Co-processing. One component was the study on co-processing waste in cement plants as an alternative solution for solid waste disposal in Can Tho³. The preliminary findings of the study indicated that there is only one license firm doing co-processing in Viet Nam with others waiting for official permits or just having conducted trial burns. Co-processing has the potential of substituting 7.5 million tons of coal and reducing emissions by 14.5 million tons of CO₂e in the country. The government of Viet Nam has provided a relevant legal framework for co-processing activities that cement plants can follow. Although the national government is promoting co-processing technology, some provincial/ district governments still have limited knowledge about the practice and thus a wrong perception about co-processing. Clear technical guidelines for pre-processing activities are missing. Pre-processing activities include the process to turn waste into alternative fuels and raw materials. The pre-processing activity is necessary for successful operation of co-processing and treat waste safely in kilns without creating impact to the cement product quality.

Photovoltaic power generation. Technical studies in Da Nang and Ninh Binh also indicate the feasibility of photovoltaic electrical plants that – using about one-third of the rooftops of existing buildings to install photovoltaic

panels – could cover 31% of the electricity demand in Tra Noc and 14% in Hoa Khanh with a payback period of around eight years. These investments would result in a savings of around half a million USD in each industrial zone and would avoid over 33 000 t/CO₂ annually. The technology proposed by the project has been tested in Viet Nam. DeepC, a private park developer in Viet Nam, already installed a photovoltaic plant to provide electricity in one industrial park that is not connected to the grid. These opportunities are technically feasible and economically viable. However, the current regulations on electricity do not provide incentives for the necessary investments as it limits to 1 MW the amount of electricity that a private operator can sell to the grid. Also electricity generated from fossil fuel is subsidized which makes electricity from renewables financially unattractive.

Park authorities in the three provinces are considering the implementation of the opportunities for investment identified by the project. But there are also concerns pertaining to the fact that national regulatory barriers prevented the implementation and broad adoption of these opportunities. While there are enterprises that would be willing to invest in the new technology and in providing such services to park tenants, these enterprises also indicated MONRE needed to revise environmental regulations before undertaking the investments.

³ Co-processing is a technology by which cement kilns are adapted to process solid waste as fuel.

4. Financing for RECP, industrial symbiosis, and EIP investments

The transition to EIP will require that enterprises and industrial park developers have access to resources for investments. During the project preparation, UNIDO determined that programs existed to finance investments by SMEs. During project preparation, and to ensure that SMEs had access to the necessary financial resources for technological transition, UNIDO invited three funding institutions to pledge their share of co-financing towards the project. These were Viet Nam Environment Protection Fund (VEPF) with USD 5 million, Viet Nam Development Bank (VDB) with USD 1.7 million and Green Credit Trust Fund (GCTF) of SECO with USD 3 million.

Acting on the assumption that the main barrier to financing was the lack of information among SMEs and IZ on how to access financing of the established financial institutions, early in the implementation process the project commissioned a set of guidelines on the financing requirements of 15 different institutions for SMEs in

Viet Nam. However, in the 2017 PSC meeting, several stakeholders highlighted the need to assist further enterprises to secure the financing needed to carry out the RECP investments that were outside their reach. Still, by August 2018, none of the enterprises participating in the RECP assessments had accessed financing. To address this constraint, the project commissioned a consultancy to update the guidelines to financial institutions, develop and carry out training workshops for enterprises and industrial zone managers in the three IZs and help enterprises develop 15 bankable proposals to financial institutions.

The Handbook *How to Access Green Financing in Viet Nam* was prepared by December 2018 and workshops in the three IZs trained 68 persons (including enterprises, park authorities, and provincial authorities). Investment options for 46 enterprises were reviewed and 14 cases identified in which bankable proposals were feasible



and in which SMEs had expressed interest to submit a proposal for funding. By 2018, there were only 4 active suitable financial institutions. The Green Credit Thrust Fund, which had been one of the initial key partners in the process, was not operating. SECO decided to hold granting activity in account difficulties stemming from the way the Green Credit Trust Fund was structured. SMEs found that the financing terms of most of the granting institution were not attractive (collateral requirements were too high; interest were at market rates or repayment time too short). The participating enterprises choose to submit the funding proposals to VEPF as this agency had the most attractive terms (financing 50% of the investment with a 2.6 interest rate). The nine proposals were submitted for funding to VEPF in late 2018. In the meantime, in January 2019, VEPF changed its financing criteria which made water treatment plants non-eligible. This decision disqualified seven of the funding proposals for funding. By June 2019, one qualifying loans was still under review and only one was approved. VEPF also dropped the priority ranking of energy efficiency project, significantly reducing the

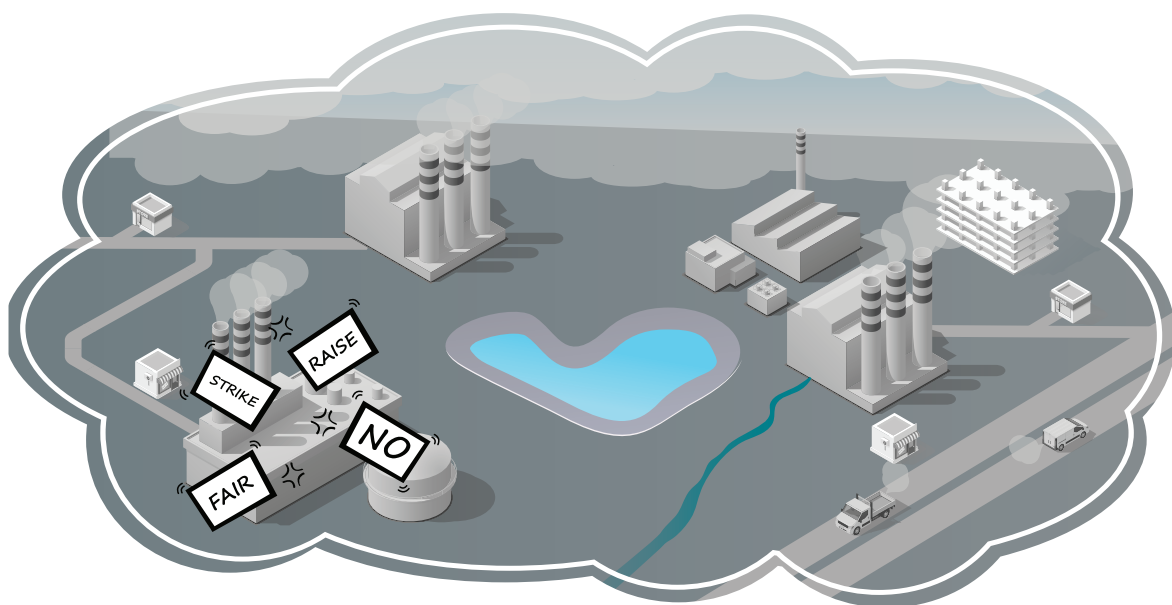
possibilities that this fund would finance photovoltaic projects.

Enterprises that participated in the green financing workshops were hesitant in applying for funding to Vietnamese financial institutions despite the preferential rates. They feared that the complicated procedures and delays will affect their business performance. Thus, enterprises often prefer to limit their investments to their available resources. The willingness of SMEs entrepreneurs to invest their resources in RECP and IS was an important factor in moving forward the EIP agenda. But it is also clear that the administrative difficulties in accessing credits are a barrier to EIP development in Viet Nam. Some of the necessary investments are simply out of the reach from SMEs, other investments (such as in-plant water treatment systems) that will reduce pollution but that do not generate economic returns will not be attractive to SMEs unless environmental regulations are strictly enforced.

5. Capacities to address community concerns regarding environmental accidents and pollution

There were reportedly frequent disputes over pollution and environmental accidents between park authorities and communities. For example, community stakeholders in Ninh Binh reported that before the establishment of the IZ, the surrounding community did not give much thought to environmental impact and incidents due to low industrial activities. As production activities in the IZs increased, members of the community gradually became more aware of the negative environmental impacts of the IZ such as uncontrolled discharges of contaminated water, thick smoke, and dust emitted from factories. The community's

initial response was to report these incidents to district authorities. The commune would then wait for a solution by the authorities. When responses from the authorities did not come or were slow, the communities took matters in their own hands by blocking the entrance of the IZ or stopping trucks from using rural roads. A member of commune leadership recalled: *"At the beginning, we thought that IZ would mean more employment for our villagers. Then we understood that more enterprises meant more pollution. Heavy trucks damaged our roads, made a lot of dust, and dropped waste along the road. We were*



frustrated and blocked our roads. At that time, our relations with the IZ management was bad.”

The project faced the challenge of finding common ground for collaboration among the different parties. In 2016, the project carried out an in-depth assessment, including three consultation workshops on the level of awareness on environmental, labor and gender aspects in the three industrial zones and assessed the interactions between provincial authorities, IZ developers, enterprises and the surrounding communities. The report indicates that in the three targeted IZs collaboration between companies and local authority in resolving environmental incidents occurred but that generally this collaboration was not very effective. Communication among stakeholders was poor. Different line provincial departments often operated independently and with little coordination. Industrial Zone Management Boards (IZMBs) often did little to promote community participation in solving issues pertaining to labor practices, natural resource use, and pollution. This study provided a baseline on the perception, knowledge, attitude, and practices of internal and external stakeholders.

The assessment also found that all parties agreed on the need to improve prevention and response of environmental incidents and pollution. Thus, the project focused on improving communication between IZMBs and communities to prevent and report environmental accidents, and in raising awareness and building capacities within communities to respond to environmental accidents. The project also carried out a study in the selected IZs that identified the risks of environmental accidents and the number of residents that could be affected if environmental accidents occurred. Another report focused on the awareness of communities on the risks of environmental accidents and the importance of prevention, preparedness, and response activities. These two reports were used to develop a handbook for the prevention, preparedness, and response to environmental accidents from IZs. The project also developed outreach materials and leaflets that targeted the IZ developers, enterprises in IZs, and people living around IZs.

The handbook presents information that equips the users with a basic understanding of common conditions that

could cause environmental accidents from IZs and also provides ways to assess potential risks. The handbook also defines the responsibilities and necessary actions before, during, and after accidents for each stakeholder group based on existing regulations and international and domestic experiences.

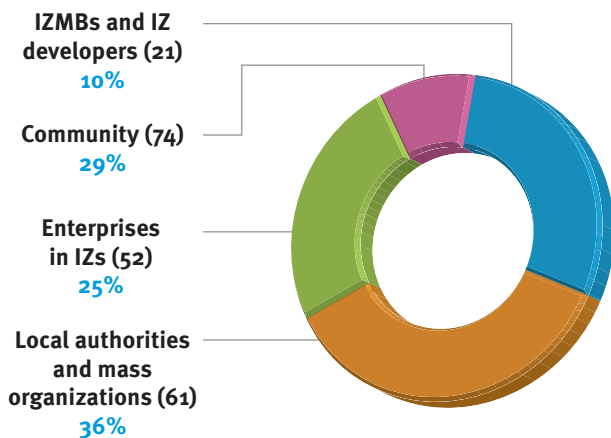
Based on handbooks and leaflets, the project carried out six training workshops, 2 in each province. These workshops had two main target groups: (i) Local authorities, mass organizations (such as Women's Union, Farmers' Association, Association of Veterans, Youth Union) and community living around the IZs; and (ii) Enterprises in IZs, IZ developers, IZMBs and provincial departments (DONRE, DOLISA, Department of Construction, Department of Health, DOSTE, DOIT). These workshops included 208 participants (of which 64% were male, 36% were female).

At the level of the individual, the training delivered by the project helped raise awareness and understanding of under which conditions and forms environmental

accidents can occur. Participants also have a better understanding of the channels (formal or informal) they can use to communicate to authorities accidents and possible environmental risks.

At the community level, the Commune People's Committees have been more proactive in addressing environmental and safety concerns. The commune leaders reported that they encourage villagers to plant more trees, clean up their gardens to prevent fires and to keep access roads clear. The interactions during the workshops have also helped develop relationships between industrial zone management boards, provincial authorities, and community leaders. This increased the likelihood of cooperation in the prevention and solution of environmental accidents. The project has also promoted the use of "Good Morning Show" in the national television system as a channel available to community stakeholders to report environmental accidents. A community leader of the Phu Khanh Commune People's Committee reported that this new informal channel was quite effective as it had led to prompter responses to environmental problems from provincial authorities and IZ developers.

Composition of training participants in readiness and response to environmental accidents



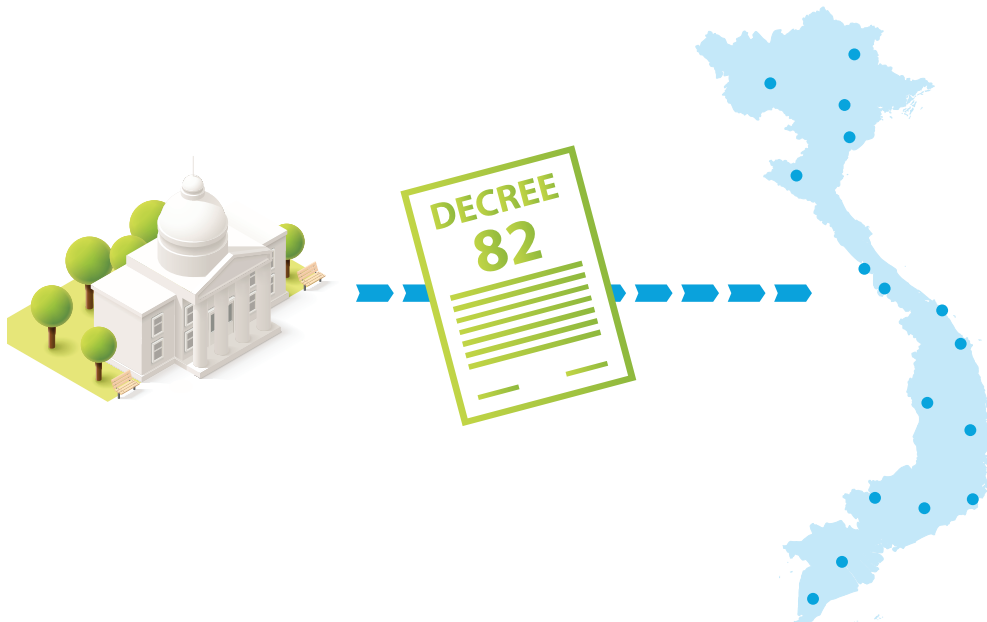
Even though the communities in the three IZs have more channels to report environmental concerns, they don't always have the means to ensure prompt action by provincial authorities or IZDBs. Most efforts to prevent and respond to environmental accidents were still internal to the community. While the project has helped to open some communication channels with the authorities, community leaders still felt that more action is required to ensure that communication is two ways. Under these conditions, some community leaders were not confident that community plans could be implemented if developed.

6. Policy and regulatory conditions supportive to eco-industrial parks

On May 2018 the Government of Viet Nam approved Decree 82/2018/ND-CP: The Management of Industrial Parks and Economic Zones (Decree 82) which introduced the concept of eco-industrial parks into the national legislation. Moving beyond the Green Growth Strategy which focuses on of GHGs and pollution reduction, Decree 82 emphasizes the need for holistic approaches to transform the production process and identified the eco-industrial park as a key aspect of the new policy. Decree 82 also called for incentives for “enterprises operating within eco-industrial parks that participate in cleaner production activities, efficient use of resources and industrial symbioses” and for enterprises developing infrastructure for eco-industrial parks. Decree 82 specified responsibilities for several ministries and park management authorities in ensuring the sound environmental management of EIP. Decree 82 included the following five articles on EIPs:

- Article 40: Objectives of development of eco-industrial parks;
- Article 41: Encouragement policies on development of eco-industrial parks;
- Article 42: Criteria for determination of eco-industrial parks: 9 (RECP and IS);
- Article 43 Incentives granted to enterprises operating within eco-industrial parks;
- Article 44: Processes and procedures for applying for registration for certification of eco-industrial parks.

Many factors led to this important policy decision. Environmental accidents and specifically, the Formosa Plastic accident that resulted in a massive fish kill in the coastline of Ha Tinh, Quang Binh, Quang Tri, and Thua Thien Hue in April 2016. These accidents contributed to an awareness and concern among the public and



policymakers of the risks related to uncontrolled industrial development.

In this context, the EIP project had an important supportive role during the development of Decree 82 by demonstrating the relevance and feasibility of EIPs in Viet Nam and by demonstrating the benefits of RECP and IS to SMEs. The project approach to sponsor study tours for public officials, business leaders, and academicians helped them understand firsthand the benefits generated by eco-industrial parks. The expert group meetings allowed experts from Viet Nam and other countries get to know, compare and learn from the experience in many countries and to discuss challenges and opportunities in the establishment of eco-industrial parks and novel concepts such as industrial symbiosis. Through these events, the project provided the conditions by which Vietnamese key stakeholders jointly develop a common understanding of what worked for the case of Viet Nam. For example, the first expert group meeting sponsored by UNIDO and the World Bank included 140 participants of which 78 were from local, provincial and national decision-making bodies relevant to industrial zones and 25 were national and international experts on different aspects related to EIP. One of the outputs of this expert group meeting was a definition of EIP adapted to the Vietnamese context:

“An eco-industrial park is a model of industrial zone that combines in harmony the three pillars of sustainable development: economy, society, and environment. In an EIP, economic development activities including site planning, investments, and marketing foster resource efficiency, dissemination of clean technologies, and environmental protection”.

As indicated above, the concepts and discussion carried out during these meetings also served as a solid technical foundation for the development of Decree 82 and the related ministerial circulars that were under elaboration at the end of the project. Three circulars will be drafted by

MPI, MONRE and MOST. While typically difficulties in inter-ministerial cooperation in Viet Nam pertain, all ministries involved anticipate that the collaborative process begun in the project was likely to continue and that it is likely to have the circulars drafted by the end of 2019 or early 2020.

Two additional project contributions to the formulation of policies are:

- a) The support to the development of environment, social and economic Indicators for EIP, including a detailed overview of monitoring requirements, targets against indicators, guidelines towards calculation of indicators (presented and discussed during a consultation meeting with several stakeholders) and
- b) A roadmap to 2030 for Viet Nam to transform industrial parks into EIPs, including tasks, expected results and responsible stakeholders.

Stakeholders all agreed that these were important steps in the process but also that key regulatory barriers remain that continue to prevent the adoption of the opportunities for RECP, IS, and further development of EIP in Viet Nam. The barriers frequently mentioned by stakeholders pertained to the generation of electricity, prohibitions of the use of treated water, a lack of a comprehensive approach to industrial solid waste management and administrative barriers to the access of financial resources by SMEs.

7. Transformative impact and project sustainability

The project made important contributions to the conditions necessary for the transformation from IZ to EIP in Viet Nam by helping to build the foundations for a sustainable industrial development trajectory. The project has also fostered the mainstreaming, replication, and scaling-up of innovations that can help retain the development momentum towards EIPs. However, the transition will take place through an iterative process of continuous improvement over time. To maintain this trajectory of development, it will be necessary to continue fostering the prerequisites of transforming IZs into EIPs. This will require an ongoing effort to identify and manage risks and barriers that endanger or obstruct this development trajectory. The final independent evaluation identified the following risks to the sustainability of the new trajectory of development.

- The message does not reach the enterprises that need to implement change;
- Labour and technical capacities are insufficient to implement the needed technologies at the required scales;
- The SME difficulties in obtaining financing keep adoption of innovations to “low hanging fruits;”
- Conflict resurgence in account of an insufficient follow-up to the strengthening communication channels and capacities among communities, IZs, and enterprises to prevent environmental accidents ;
- While the adoption of Decree 82 was an important step in the establishment of the policy framework for EIPs, multiple regulatory barriers remain that prevent the adoption of RECP and IS options.

The environmental, economic, and social benefits generated thus far by this project are highly likely to be sustained after the project ends since the benefits result

from new practices fostering business and that made enterprises and IZs more competitive on a long-term. Other long-lasting benefits stem from addressing community concerns and reducing tensions between communities and IZ. While significant work remains in addressing community concerns, the project introduced approaches that helped reduce the risks of environmental accidents by building readiness and response capacities within the communities. Overall conflict reduction was achieved by improving the communication between industrial zone management boards and the local communities.

Despite achieving important benefits, it is key to continuously pursue the ultimate objective of this project which aims beyond reducing a certain amount of GHG or making a certain number of SMEs more profitable. This is due to the effective adoption of RECP or IS. The project’s ultimate objective was to support the transformation of IZ to EIP in Viet Nam. The project has contributed to for the prerequisites of this transformation by building stakeholder capacities. Stakeholder are now equipped to assess, identify and carry out changes in different domains (in policies, technology, and business models) and scales (national, provincial, industrial zone, enterprise). These contributions are mere initial steps in a process that reaches beyond the spatial and temporal niche in which the project operated.

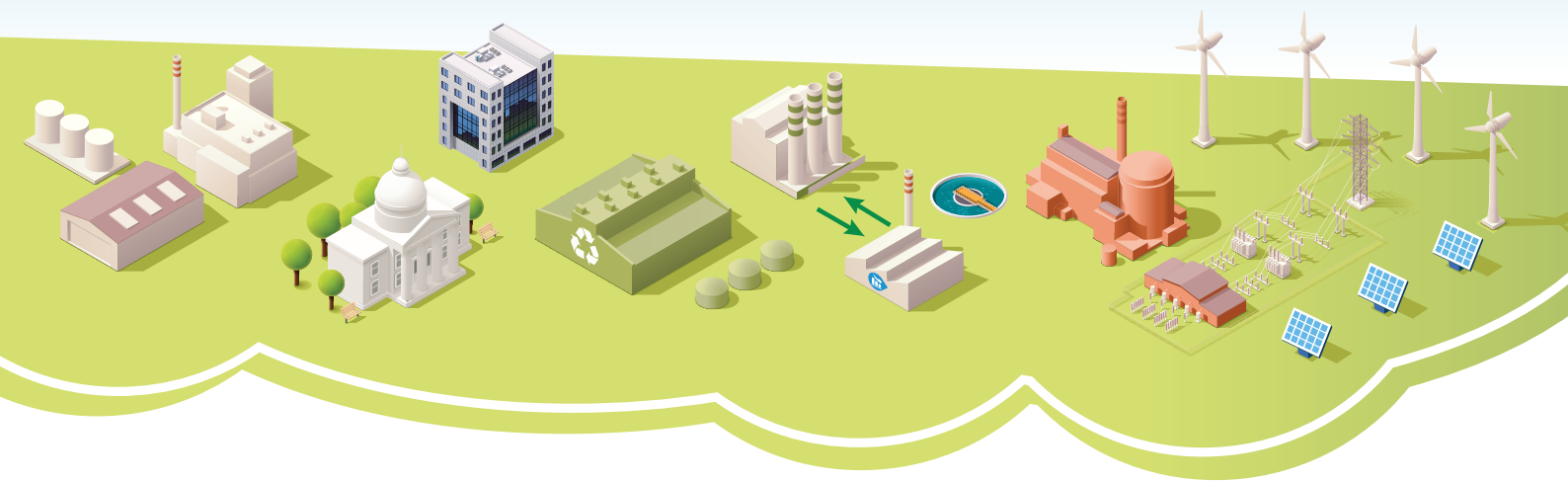
8. Project monitoring

The project had a highly effective monitoring system to track project results. The consultant teams implementing project activities were responsible for developing baselines, tracking information, and regularly reporting progress on project activities and results to the PMU and the management team in UNIDO. Each major consultancy (such as the initial assessments of solid waste and wastewater, RECP, IS, the development the green funding guidelines and the development of funding proposals) was also required to submit a final report that provided an analysis of project accomplishments, challenges, and lessons derived from the experience. Consultants submitted the monitoring data, and reports to the PMU. UNIDO compiled the data received and reviewed these data for inconsistencies, duplication, and other possible

errors. The respective information was summarized and reported in the PSC meetings every year and reported to the GEF in the annual project implementation review. The meticulous monitoring and documentation of the key aspects of the project provided the final independent evaluation with a wealth of information that allowed a reliable assessment of the project results.

The project, in collaboration with the IFC and MPI, also developed a system of EIP indicators adapted to the conditions in Viet Nam. Once completed, this system of indicators will be used by MPI to track and report progress in the national transition to EIPs. This indicator system will benchmark and publish the extent of the progress achieved by the different industrial parks in Viet Nam.





9. Lessons and recommendations

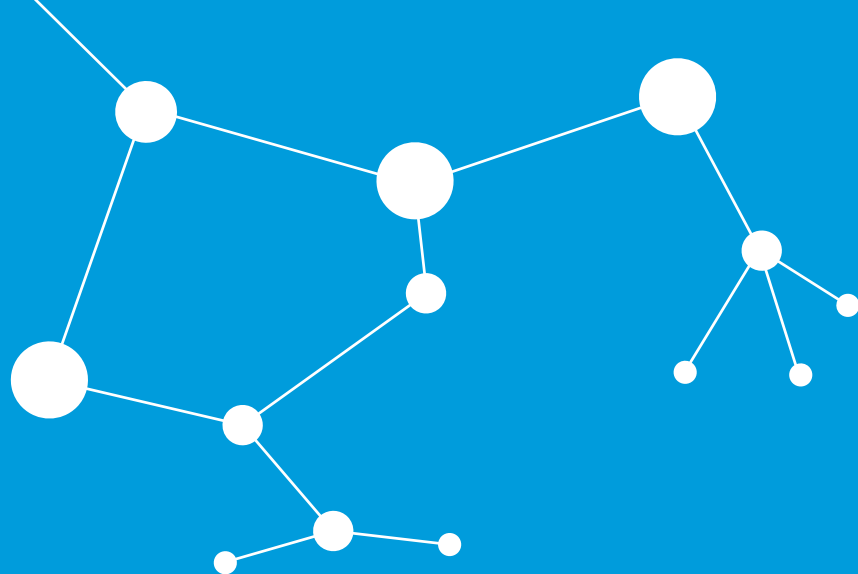
Lessons

- RECP and IS are effective tools to support the development of EIPs, and to improve competitiveness of enterprises while at the same time reducing the use of resources, GHG emissions and pollution in general.
- Most SMEs located in Viet Nam industrial zones lack specialized managers or technical staff. This situation required a higher effort than originally anticipated by the project to develop awareness and capacities in the early stages of engagement with SMEs.
- Long-term development partnerships, such as the twenty years partnership between UNIDO and VNCPC, are effective ways to develop capacities for sustainable development.
- Collection of data required to identify RECP or IS opportunities is time consuming and requires a strong commitment of participating enterprises and industrial zone management boards.

Recommendations

- **Recommendation 1.** MPI, MONRE, and MOST should ensure a quick drafting of the ministerial circulars for Decree 82. This process should engage key stakeholders through a consultation that fosters dialogue among central government ministries, provincial governments, industrial zone development boards, SME representatives, representatives of IZ surrounding communities, academia, and NGOs.

- **Recommendation 2.** MPI, MONRE, and other relevant institutions should immediately initiate a process to set standards that remove the following regulatory barriers to EIP development:
 - The one-megawatt restriction of electricity generation by entities connected to the grid.
 - The prohibition of the use of used industrial wastewater after it has been properly treated.
 - The lack of a comprehensive policy pertaining solid waste management that would ensure maximum recycling (material and thermal) as well as proper and safe disposal of waste that can't be recycled.
- **Recommendation 3.** The government of Viet Nam, SECO, VEPF, and other financial institutions in Viet Nam should continue to explore ways to overcome administrative barriers that prevent SMEs from having access to the financial resources necessary to invest in technologies needed in the transition to EIPs.
- **Recommendation 4.** UNIDO and MPI should in future projects more closely examine *ex-ante* the enterprises financial health and business plans to help reduce the enterprises drop off rate during implementation.
- **Recommendation 5.** MPI and the governments of the provinces of Can Tho, Da Nang, and Ninh Binh should build on the constructive experience of the project to continue enhancing communication between industrial zone management boards and surrounding communities and to develop mechanisms that give a voice to communities in the planning and monitoring of industrial zones.





UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Vienna International Centre · P.O. Box 300 · 1400 Vienna · Austria
Tel.: (+43-1) 26026-0 · E-mail: info@unido.org
www.unido.org