



Électricité de France – EDF Water, Sanitation and Hygiene for Employees – The Nam Theun II Experience

Executive Summary

The World Business Council for Sustainable Development (WBCSD) is calling for businesses to sign the Pledge for Access to Safe Water, Sanitation and Hygiene (WASH) at the Workplace¹, which aims to ensure appropriate access to safe WASH for all employees in all premises under direct company control. This case study relates implementation experience by Électricité de France (EDF), as one of the first signatories of the Pledge.

Implementation is on the way via the inclusion of the Pledge within two existing EDF processes: (1) The Commission for Hygiene, Security and Working Conditions of employees – an institution in charge of employee health, safety and working conditions; and (2) EDF's Corporate Social Responsibility Agreement.

This case study provides implementation details by focusing on the Nam Theun II dam in Laos, a leading practice example when it comes to EDF's construction sites. Besides giving a concrete overview of what implementing the Pledge means in practice – showing that implementation can be efficient albeit very simple – such a successful story demonstrates the “applicability” of the Pledge to mobile remote worksites in which the Pledge implementation is less straightforward than in factories or offices. Issues such as implementation across the value chain – both for suppliers and employees' homes and communities – are addressed as well, even though it is imperative to bear in mind that they are not part of the Pledge commitment as such.

We encourage others to follow EDF's example and share their experiences as part of the sharing and learning process from implementation of water, sanitation and hygiene within company operations. Indeed, both the [Guiding Principles for Implementing the Pledge for Access to Safe WASH at the Workplace and the Self-Assessment Tool](#) that the WBCSD has developed to support Pledge implementation by signatories are living documents: they will continue to evolve over the years as companies provide feedback on the strategies that have worked well and those that have been less successful.

¹ Visit the Pledge webpage for more details: <http://www.wbcasd.org/washatworkplace.aspx>

Background & Introduction

EDF and the WBCSD Pledge for Access to Safe Water, Sanitation and Hygiene at the Workplace

Many businesses have operations and employees in countries lacking access to safe Water, Sanitation and Hygiene (WASH). By signing and implementing the WBCSD Pledge for Access to Safe WASH at the Workplace, which aims to ensure appropriate access to safe WASH for all employees in all premises under direct company control, businesses can make a direct contribution to the universal realization of the Human Right to Water and Sanitation.

The business case is straightforward: investing in safe WASH for employees means a healthier and more productive workforce. Additional tangible business benefits include a more secure social license to operate and increased brand value.

EDF, one of the two WBCSD Water Leadership Group Co-Chairs along with Borealis², was among the first companies to sign-up to the initiative, in September 2013³. The main argument for doing so was the fact that EDF was already compliant with the Pledge: signing the Pledge was a win-win as it was a way for the company to showcase its best practices in the field of access to safe WASH.



Figure 1: Cover of the Pledge Guiding Principles for Implementation, downloadable freely on the [WBCSD website](http://www.wbcscd.org/washatworkplace.aspx).

Implementation is now on the way via the inclusion of the Pledge Points of Reference⁴ within two existing mechanisms in EDF:

- The Commission for Hygiene, Security and Working Conditions of employees⁵ (CHSCT) – an institution in charge of employee health, safety and working conditions in every French organization composed of at least 50 employees: meetings between the CHSCT and diverse company representatives (e.g. staff and management representatives, labor unions, etc.) are organized on a monthly basis in order to discuss new rules and regulations if any, hear staff representatives' feedback, and examine potential claims;

² As of November 2014.

³ Cf. WBCSD Stockholm World Water Week Blog, 2013: 'Have you pledged to provide safe WASH to ALL employees at the workplace?' available at http://wbcscd.typepad.com/the_business_of_water/2013/09/have-you-pledged-to-provide-safe-wash-to-all-employees-at-the-workplace.html

⁴ These Points of Reference, against which Pledge compliance can be assessed, are part of the Guiding Principles for Implementation (page 12), which are downloadable freely on the Pledge webpage: <http://www.wbcscd.org/washatworkplace.aspx>. In the case of EDF, the WASH criteria were already part of the two below-mentioned mechanisms (CHSCT/CSR). EDF teams simply had to verify that the Pledge Points of Reference coincided with EDF's internal criteria, which was the case.

⁵ Commission d'Hygiène, de Sécurité, et des Conditions de Travail in French.

- EDF's Corporate Social Responsibility (CSR) Agreement: besides annual audits run by external auditors in view of the Sustainable Development Report, any slight deviation from the minimum level of standards, in any EDF subsidiary, is reported back through a monitoring and complaint mechanism⁶.

Overall, EDF has been assessed as being compliant – and even beyond leading practice (see the 'Moving beyond the Fence' section) – with the Pledge in all its French and European working sites⁷. Outside Europe, the same criteria and management systems are applied, but rules are likely to be less stringent overall. Indeed, most of the projects overseas are construction sites that, in most cases, involve temporary work sites. Hence there may be some deviations as compared to the usual level of provisions applied by EDF, even though the minimum level of standards is always provided. A leading practice when it comes to EDF's construction sites however, is the Nam Theun II dam (NT2 hereafter) in Laos.

The Nam Theun II dam experience⁸

Situated in the heart of Indochina, Laos is a mountainous, landlocked country with many rivers and forests. With a population of only six million, hydroelectricity exports to its neighbors, in particular



Thailand, are currently the main opportunity for Laos to develop in a sustainable manner.

The past ten years have seen tremendous growth within Laos as NT2, an expansive, modern hydroelectric project, has progressively emerged as a base for the country's development and an integral part of the country's National Growth and Poverty Eradication Strategy. The project's development process and its implementation have been instrumental in fostering economic reforms in Laos and its integration in the regional economy. This landlocked country in fact plans to use its hydropower potential of 20,000 megawatts to become the "battery" of the Greater Mekong Sub region.

Figure 2: Location of NT2 dam project in the Mekong River Basin

⁶ In practice, there is a green number that each and every employee can call to report back on any slight deviation he/she may have observed. These calls are reported back to EDF's management team, which responds accordingly.

⁷ This assessment was made via the two above-mentioned mechanisms, as any slight deviation from the minimum level of standards in terms of CSR and Health and Safety requirements (both of which are aligned with the Pledge Points of Reference as mentioned in the Footnote n°4) is reported via employee calls (see Footnote 6) and at CHSCT meetings respectively.

⁸ Source: WBCSD Case Study 2008, 'Electricité de France, Powering the future of Laos', available at: http://oldwww.wbcscd.org/DocRoot/x4Fp7mlvul4jqKtSG6LF/edf_laos_hydro_full_case_final_web.pdf

Built on the Nam Theun River, a Mekong tributary⁹, the 1070 MW NT2 dam is ran by the NT2 Power Company (NTPC), a limited company formed and owned by three shareholders – EDF (40%, also Head Contractor), Lao Holding State Enterprise (25%, a state-owned company, established in 2005 to hold the Lao government's shares in the NTPC), and Electricity Generating Public Company Limited (EGCO, 35%)¹⁰. The Concession Agreement between the NTPC and the Lao Government stipulates that the NTPC will build and operate the project for the first 25 years of its operation. This trans-basin project reached full load operation in March 2010.

“One of the defining features of NT2 has been the comprehensive environmental and social measures designed to mitigate potential impacts and to ensure all World Bank safeguards are complied with. [...] These measures have been put in place along with a programmatic approach that aims to maintain Lao PDR's macroeconomic stability and economic growth, and targets project revenues to poverty reduction and environmental protection,” says a 19 September 2007 article on the World Bank website entitled “Nam Theun 2: A Way to Better Hydro Projects”¹¹.

Access to Safe Water, Sanitation and Hygiene at the workplace

The Lao preference

In its Concession Agreement, the NTPC had to respect the “Lao preference” principle according to which 70% of the employees must be Lao, including during the construction phase of the project. As a result, while three of the NTPC's contracts (85% of total investments) are with international companies¹², 5,000 (15% of total investments) are with local Small and Medium Enterprises (SMEs)¹³ – representing some 175 million Euros through support and transversal activities. In addition, the local staff had to be provided with regular professional training and equal compensation opportunities as the ones offered to international staff with equal competences.

There are no contractual obligations for Lao SMEs to respect international standards for safety or quality that sometimes appear strict or non-applicable due to cultural differences. For instance, employees have accepted to wear a helmet but it was difficult for them to wear safety shoes (most Lao people go barefoot). However the NTPC is in constant negotiations to update standards and regular audits to control the respect of the agreements are conducted by internal and external parties.

⁹ For more details on the project design and location, see Source: Salignat, O., Demoulin, F., and Peary, R: ‘How to address the impacts of operation on downstream communities; Nam Theun 2 experience’, paper presented at the HYDRO 2010 conference in Lisbon, Portugal: <http://www.eventassociates.co.uk/lisbon-2010-programme.html>

¹⁰ Italian Thai Development Plc. (ITD) owned 15% of the shares in the beginning of the project, but sold them to EDF later on.

¹¹ <http://www.worldbank.org/en/news/feature/2007/09/17/nam-theun-2-a-way-to-better-hydro-projects>

¹² (1) Civil Works and Hydro-Mechanical Equipment: Joint Venture between Italian Thai Development (ITD) and Nishimatsu Construction Co.; (2) Power Station Equipment: EMWUN Consortium between General Electric, ABB, and Clemessy; (3) 500 kV and 115 kV Transmission Lines: Joint Venture between Mitsubishi Corporation and J-Power Systems Corp. These three main sub-contractors are directly reporting to EDF, who, in turn has to report, as the Head Contractor for the project, to the NTPC. See Figure 3 for a schematic view of the NT2 Governance structure.

¹³ These SMEs are in fact employed by the three above-mentioned international sub-contractors (see Footnote 12) for the execution of works.

At the end of the project, the NTPC expects each SME to have improved working capacities. It is also expected that the SMEs that have worked with the NTPC have understood the value of good management to help raise income and create a sustainable business¹⁴.

Another related issue of interest here is the one of sub-contractors' compliance with international standards. EDF, as Head Contractor (see Figure 3), had to comply with the Owner Requirements set-up by the NTPC¹⁵, which stipulated for most of the standards to refer to local laws and regulations. Therefore, even though EDF's service providers for hydroelectric and nuclear power plants are usually subject to the same rules as the ones applied by EDF itself in terms of Health and Safety of employees, it was complicated in this case for EDF to contractually require from its sub-contractors to abide by international level of standards. However, in practice, given the willingness of the local counterparts on the one hand and the lack of detailed local regulations in some areas on the other hand, EDF managed to adapt and apply international level of standards in most areas – including access to safe WASH. Being more prescriptive in contractual requirements was however retained as one of the main lessons learned from the NT2 project by the company¹⁶.

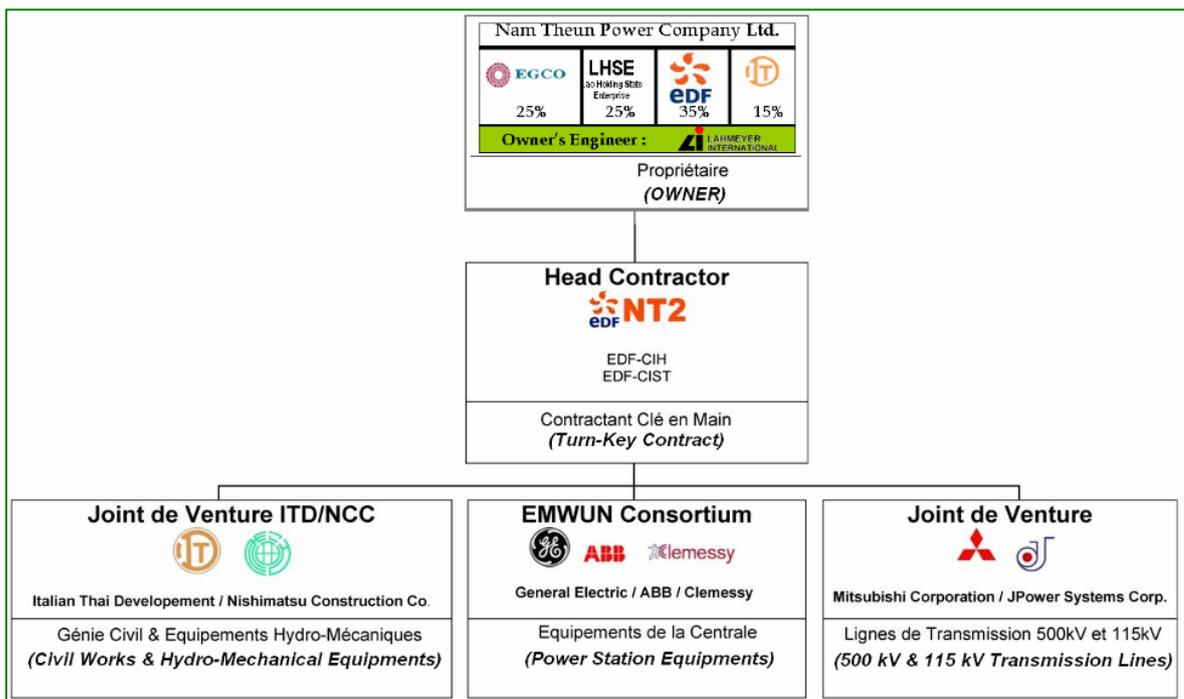


Figure 3: NT2 governance structure

¹⁴ Source: WBCSD Case Study 2008, 'Electricité de France, Powering the future of Laos'.

¹⁵ The Owner Agreement can be seen as the operational translation of the Concession Agreement.

¹⁶ Aude Mourrat, Programme Officer for Security, Surety, and Environment at EDF, phone interview, August 2014.

Key facts and figures¹⁷

In terms of access to safe WASH specifically and compliance with the WBCSD Pledge, the process was the same as the one followed at the headquarters level. Similarly to the French CHSCT, local Site Committees for Hygiene and Security were put in place within the NTPC and within each of the contracting enterprises. Inter-Enterprises Committees for Hygiene and Security were run on a monthly basis. Access to Safe WASH was part of these committees' mandate, including among others:

General criteria¹⁸:

- Compliance with local and national laws/regulations: as mentioned above (see the 'Lao preference' section), the Owner Requirements that EDF signed as Head Contractor required compliance with local laws and regulations for all the below-mentioned criteria. As most of these were inexistent in Laos, EDF referred to international level standards in practice.
- Provisions for temporary and mobile work sites: interestingly enough, the 15 main construction work camps (1 principal and 14 secondary, a total of 9000 workers approximately at the peak activity, with 3000 on the principal camp), which would normally¹⁹ be considered as mobile work sites, were here considered as 'fixed' camps as opposed to the 'temporary' work camps (20 approx.) which were being moved according to the advancement of the works (given the distance to which the works extended, especially the roads and the electricity lines). Both types of camps were equipped with adequate access to safe WASH but more stringent standards were applied to the fixed camps (as these included the bathing facilities and kitchen/restaurant).

Water supply criteria:

- Provision of drinking water in adequate quantity and quality: one drinking water station was installed in the main camp and provided every other secondary/temporary camps (via trucks and water tanks – see Figure 6c below). A drinking water treatment plant was also installed in the main camp (see Figure 6b below). In addition, a team was put in place specifically to monitor water quality, according to a stringent Potable water monitoring procedure.
- Treatment of waste water from catering facilities and bathing areas: The objective is one of Zero Pollutant Discharge. All sanitary effluents were treated by biological treatment facilities and septic tanks.



Figure 4: Drainage system in one of the working sites

¹⁷ This part focuses on the construction phase of the dam rather than the operational phase as the latter is less relevant from a learning & sharing of experience perspective (mobile and temporary work sites are the most challenging ones in terms of Pledge implementation).

¹⁸ For clarity purposes, the structure in this part corresponds to the one adopted in the WBCSD Pledge Guiding Principles' Points of Reference (page 12-18). See Footnote 4 for full reference.

¹⁹ According to the Pledge Points of Reference (see Footnote 4 for more details).

Sanitation criteria:

Provision of toilets in sufficient numbers²⁰ and in conformity with international level standards was ensured. Each toilet was indeed:



Figure 5: Toilet seats provided in one of the working sites. Designed according to local customs (no toilet seats as these are not used in the region).

- Equipped with basic ventilation (PVC pipe through a hollow brick) and lighting systems (windows);
- Equipped with lockable doors to ensure personal safety and privacy;
- Designed according to local customs (no toilet seats as these are not used in the region), and taking into account specific gender needs (gender-separation provisions made in the main camps; in other camps, women and men did not use the bathing facilities at the same time).

Hygiene criteria:

- Provision of bathing/hand-washing facilities: the camps were equipped with an adequate number of water containers (one per ten workers per shift approximately) for washing and personal hygiene purposes. Additionally, washbasins were placed at targeted locations such as close to the kitchen and adjacent to lunch areas.
- Regular training of workers on security, health and hygiene issues, and awareness building on hygiene good practices: awareness campaigns were undertaken on a regular basis and posters in Lao language were provided in every camp, including signage for appropriate hand-washing behavior.
- Regular monitoring, cleaning and maintenance of the above mentioned WASH facilities: an EDF team was in charge of visiting each camp once per week to check whether cleaning and maintenance of the different facilities was performed adequately – a training session had been performed at the beginning of the works to the respective camp managers. When necessary, improvements and corrective actions were taken.

²⁰ 1 toilet per 20 workers on the working sites and 1 per 15 persons in the camps: these numbers are slightly inferior to the Pledge level of compliance (2 toilet seats and 2 urinals per 45 male workers and 3 toilet seats per female). This is mainly due to the same issue as the one explained in the top paragraph page 5 on sub-contractors' compliance with international standards. The above mentioned numbers were thus chosen by EDF as the ones fitting workers' needs the best.



Figure 6: (a) Top left-hand picture: toilet (right) and water container for washing and personal hygiene purposes (left); (b) Top right-hand picture: drinking water treatment plant in the main camp; (c) Bottom left-hand picture: water tower in the main work camp – as a direct drinking water source for the main camp and an indirect one for secondary camps (to which drinking water is transported via trucks and water tanks, see picture d); (d) Bottom right-hand picture: water tanks for transporting drinking water from the main camp to secondary work camps.

Moving beyond the fence - Access to safe Water, Sanitation and Hygiene in surrounding communities²¹

The application to service providers/contractors of the same Health and Safety rules as the ones applied to EDF's own employees (see the 'Background and Introduction' section) is not part of the Pledge commitment per se. Therefore, this places EDF beyond leading practice in providing access to safe WASH at the workplace according to the Pledge points of reference²².

Provision of access to safe WASH for the communities displaced by the dam is another area where the company has moved beyond leading practice. It was undertaken by EDF in the context of the

²¹ Source: Salignat, O., Demoulin, F., and Peary, R: 'How to address the impacts of operation on downstream communities; Nam Theun 2 experience', paper presented at the HYDRO 2010 conference in Lisbon, Portugal: <http://www.eventassociates.co.uk/lisbon-2010-programme.html>

²² See Footnote 4 for full reference.

adoption of a strategy to address downstream impacts of the dam. Part of this strategy consisted of a Downstream Social Program, a 16 M USD multifaceted program intended to directly compensate for some of the livelihood losses, which ended-up providing livelihood support and fostering socio-economic development in the whole area. Endorsed by the Government of Lao and jointly implemented by the NTPC and the local administration, its design and implementation spanned from 2006 to 2013.

Access to safe WASH was part of the impacts that were directly addressed and compensated for – contrary to fisheries which, as a community resource, were compensated through a regional development program. The program was targeted at the area located along the Xe Bang Fai River, comprising 156 villages, which amount to 22,000 households (132,000 people in total). Among these 156 villages, 71 (totaling 9,000 households) are located on the banks of the Xe Bang Fai and are directly impacted by the dam while the other 85 villages – 13,000 households – are located at some distance from the river. But all the villagers – from the 156 villages – use the river for fishing, domestic water, transportation, irrigation, recreation, etc.

Water supply and quality improvements

The broad Environmental and Social Impact Assessment undertaken prior to the commencement of the dam operations highlighted a potential issue of water quality in waterways downstream of the power station: subsequent to the commencement of operations of the power station and to the resulting release of water to the Xe Bang Fai, water quality was expected to change through an increase in suspended matter.



Figure 7: one of the 500 boreholes equipped with Afridev pump

With many households in the downstream area using water from the river for domestic purposes, the primary water supply activity of the Downstream Social Program was therefore the construction of deep boreholes equipped with Afridev hand pumps, prior to the beginning of operations²³. By March 2010, all 71 riparian villages had been provided with equipped boreholes, with a total of 521 boreholes equipped with hand pumps (out of 533 boreholes drilled). This achievement was in compliance with the Concession Agreement which requires all riparian villages to have

²³ The issue of environmental quality of the river more broadly speaking was addressed via the installation of an aerator on the Downstream channel, which is meant to increase oxygen concentration (the dam reservoir increases the river concentration in organic matter. As organic matter consumes oxygen when it decomposes, the concentration in oxygen lowers in the river as a result of the dam reservoir).

alternative water supply provided prior to the beginning of the dam commercial operations.

However, a few of the constructed boreholes were subsequently found to have unacceptable water quality (less than 1%). This was primarily due to groundwater quality issues (high concentrations of iron, issues with turbidity or salinity). The Downstream Program replaced the boreholes identified as having unacceptable water quality²⁴.

Besides these water supply infrastructure improvements, the Downstream Program also included a range of operation and maintenance activities. These mainly consisted of demonstration activities within each district: water users were trained on how to operate and replace degenerated parts of the water supply system; and were given tools and basic spare parts along with a handbook on how to maintain and repair the AfriDev hand pumps.

Sanitation improvements and Hygiene awareness & training programs

Prior to intervention by the Downstream Social Program, many households in the downstream area did not have access to toilet facilities. The Program addressed this gap and made sanitation improvements (household and community toilets) in 77 villages, which amounts to 5,853 households receiving support from the Program.

The Downstream Social Program also worked in collaboration with the NT2 Public Health Support Program²⁵ to provide hygiene awareness and training programs to the above mentioned villages. The Public Health Support Program started in mid-2005 with the aim of strengthening the capacity of local health services and to improve health infrastructure regionally. It consisted of five main intervention areas: infrastructure development, capacity building, health education and awareness, health service delivery development, and monitoring and surveillance. Overall, it was assessed that more than 200 000 people were reached by health education and awareness events, placing the program among the best examples of capacity building and health delivery service improvement in Laos.

The concept of WASH Environmental Sustainability – NT2 and the First Waste Processing Centre in Laos²⁶

“Environmental sustainability needs to be at the core of WASH practice. A landscape approach to WASH planning – that considers the effects upon the surrounding natural environment – enables both the opportunities and risks that ecosystem services provide to be assessed and included” (Wetlands International, 2013)²⁷.

The NT2 dam is a good example of such an integrated approach as it includes the construction of a Waste Processing Centre (WPC), on top of the ‘classical’ provision of access to safe WASH. The WPC, the first of its kind in Laos, comprises two main units:

²⁴ The boreholes had been built at a distance sufficient not to be affected by the environmental impacts of the dam; these problems were therefore exclusively the result of geographical conditions – groundwater quality.

²⁵ NTPC, 2011: ‘Nam Theun 2 Public Health Support Program handover to the Government of Laos’, Press release (available at: <http://www.namtheun2.com/environment-a-social/public-health-program.html>)

²⁶ Mourrat, A., Méchali, J-D., & Lemoine, P., 2007 : ‘The First Waste Processing Centre in Laos’, Presentation for the EDF’s Entrepreneurship Trophy 2007

²⁷ Wetlands International, 2013: ‘Putting environmental sustainability at the core of WASH Practice’, available at: <http://www.wetlands.org/News/tabid/66/ArticleType/ArticleView/ArticleID/3448/Default.aspx>

- A separation center – where the domestic waste from NT2 construction sites is sorted in order to extract all the dangerous waste materials (e.g. oils, batteries, paints, etc. which are then isolated and stored in a dedicated area specifically set-up for that purpose) and the recyclable materials (e.g. plastics, glass, scrap metal, cardboard, etc. which are stored before being sold to local recycling companies²⁸);
- A landfill – comprised of well-drained watertight cells (where the remaining waste, i.e. non dangerous and non-recyclable, is discharged and stored) and different ponds (where the leachate coming from the cells is treated before being released to the environment²⁹).



Figure 8: Waste sorting – cartons (left) and plastic bottles (right).

Awareness and training campaigns for the workers regarding waste management were run as well. Waste bins of different colors were installed on the camps to collect separately dangerous, recyclable, and remaining waste. 20 minute long training sessions were organized on a regular basis on the construction sites of the project to explain the rationale and the method of waste sorting and treatment.

The success of the center was recognized by the EDF's Entrepreneurship Trophy won by the project in 2007³⁰. The main success factors, along with the above mentioned renewed training campaigns, were identified as being:

- Involvement of all the partners to the project, especially local population and EDF sub-contractors (the latter really demonstrated their willingness to implement a waste management plan);
- Support to the sub-contractors by the EDF team (regarding waste sorting; identification of potential recycling SMEs in Laos to sell the recyclable waste; maintenance of the landfill etc.);
- Team leader responsibility of the center: a team in charge of managing the WPC was put in place and composed of local population staff specifically trained by EDF and EDF's sub-contractors; the leader of this team has been proved to be a key player in ensuring the overall success of the initiative.

²⁸ Except biodegradable waste and non-dangerous combustible waste that are respectively: used for animal feeding by the local population on the one hand; and burned on the other hand.

²⁹ Three anaerobic ponds and two maturation (aerobic) ponds.

³⁰ Trophées du Développement Durable in French.

Conclusion – Assessment of the potential for replication

Such a successful story demonstrates the “applicability” of the Pledge to mobile remote worksites (see the ‘Access to Safe WASH at the workplace’ section), in which the Pledge implementation is indeed less straightforward than in factories or offices. We encourage others to follow EDF’s example and share their experiences as part of the sharing and learning process from implementation of water, sanitation and hygiene within company operations. Indeed, both the [Guiding Principles for Implementing the Pledge for Access to Safe WASH at the Workplace and the Self-Assessment Tool](#) that the WBCSD has developed to support pledge implementation by signatories are living documents: they will continue to evolve over the years as companies provide feedback on the strategies that have worked well and those that have been less successful.

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