Getting ready for PROPER and other policies: global learnings and key success factors for Indonesia

Eric Mieras[a], Jessica Hanafi[b], Marisa Vieira[a], Anne Gaasbeek[a], Laura Golsteijn[a]

[a]PRé Consultants B.V., Stationsplein 121, 3818 LE Amersfoort, The Netherlands
[b]Life Cycle Indonesia, Kencana Tower, Jl. Meruya Ilir Raya No. 88, Jakarta Barat, 11620, Indonesia

Abstract

Indonesia introduced new policies, like PROPER, that require companies to develop LCA capacity. Currently, LCA expertise is still developing. Therefore, the question arises how the development of LCA expertise and a growth of LCA Practitioners can be achieved. In this article learnings and key success factors from global best practices are identified and illustrated based on case studies. The key success factors are 1) harmonization and guidance, 2) capacity building, 3) focus on business value and 4) ease of use. These Key Success Factors can give Indonesia and its LCA practitioners a head start in implementing and embedding LCA in policy implementation and compliance by private companies. Developing a program that provides the following six elements a) Introduction to LCA training, b) Training for managers and policy makers, c) Learning by doing with screening LCAs, d) Facilitate easy to use tools, e) Develop Product Category Rules (PCR) and f) Create a label or other verified report/certificate can accelerate the development of LCA expertise and the implementation of LCA practices.

Keywords: *Capacity Building; PCR Development; LCA Guidance; LCA Best Practice*

1. INTRODUCTION

The development of Life Cycle Assessment in Indonesia has been skyrocketing in these last few years. From scattered academic papers to the adoption of ISO 14040/44:2006 into Indonesian Nasional Standard (SNI) in late 2016 and early 2017. This development has been triggered by the introduction of the life cycle perspective in the environmental management system standards (ISO 14001:2015) and active collaboration between the Centre for Standardisation of Environment and Forestry (Ministry of Environment and Forestry/MOEF) and the Indonesian Life Cycle Assessment Network (ILCAN), as well as policies such as reduction in greenhouse gas emissions, sustainable consumption and production, green public procurement, eco-labeling, and green industry from various ministries [1].

In 2018, the Indonesian MOEF through PROPER Secretariat introduced the inclusion of Life Cycle Assessment (LCA) as one of the indicators in their environmental performance rating. PROPER or Program Penilaian Peringkat Kinerja Perusahaan dalam Pengelolaan Lingkungan Hidup is an environmental performance rating program initiated more than 20 years ago in 1997 to introduce a continuous improvement program in environmental management.

Participated in by 1819 companies and with growing numbers every year, PROPER consists of 5 coloured ratings, i.e. Gold, Green, Blue, Red and Black. Blue rating signify a company's compliance to environmental regulation while Green and Gold show beyond compliance and consistent achievements in environmental management, respectively [2].

PROPER drives companies to be innovative in managing their environment. The program's objective is to act as a regulatory mechanism which can promote and enforce compliance with pollution control standards by encouraging pollution reduction through the introduction of clean technology concepts, promote an environmental management system and conduct business ethically through the implementation of community development.

The environmental performance is measured through the innovative reduction strategy and the amount of reduction implemented by the company. Currently there are 8 pillars constructing the environmental performance, i.e. energy efficiency, reduction of greenhouse gas emission, water efficiency, reduction of emission to air, reduction of waste water load, reduction of non-hazardous waste, reduction of hazardous waste, and the total of funding allocated for community development. However, as the core of PROPER is innovation and continuous improvement, the secretariat believes that companies

with Green and Gold rating are ready to have LCA to be the next step to further enhance their environmental management system and to be able to compete in the global market.

In early 2018, through several sectors consultation and discussion, The Ministry of Environment and Forestry (MOEF) will be revising the Minister of Environment Regulation Number 3 year 2014 concerning Industrial's Environmental Performance Rating (PROPER). One of the assessment criteria developed by MOEF for beyond compliance criteria is the application of Life Cycle Assessment (LCA). The aims of life cycle assessment (LCA) are to identify, calculate the sustainability of the use of natural resources, disposal in the environment, and evaluate and implement the possibility of environmental improvement. Therefore, LCA serves as the basis for decision making in improving the environmental performance of the company [3].

2. APPROACH

The PROPER regulation requires companies to develop LCA capacity in order to conduct LCAs for the products they provide. That will lead to an increase of demand for LCA expertise, both internal and external. At the same time the LCA expertise in Indonesia is still developing, although there are a number of very good LCA Experts. However, the existing capacity and capabilities will not be sufficient to fulfil the total demand. In this article global learnings will be shared through case studies to show how Indonesia can scale up the use of LCA.

Based on the involvement of PRé and its partners in global initiatives, working with many LCA Practitioners worldwide and experience with scaling up LCA practices we identified four key success factors that will be described and illustrated with case studies.

Four Case Studies have been selected that illustrate how the key success factors contribute to increasing (capacity needed for) the application of LCA for decision making and policy implementation. These case studies cover multiple regions and sectors to make sure they are not biased to one specific region or sector.

3. RESULTS AND DISCUSSION

The need for capacity building and scaling up LCA efforts is not unique to Indonesia. Other countries have been in a similar situation. Based on these experiences worldwide a number of lessons learned can be identified. There are four key success factors that Indonesia can learn from:

⟩ Harmonization and guidance;

⟩ Capacity Building;

⟩ Focus on Business Value;

⟩ Ease of Use.

Each of these key success factors will be described and illustrated with a case study.

3.1. Harmonization and guidance

The first key success factor is harmonization. In LCA a lot of choices and expert judgements have to be made, for instance on the inventory data or expected use scenario. For people that are new to the field, this can be challenging. Having a set of rules that guide them can lower the barrier to get started with LCA. This guidance also assures consistency and comparability between LCA results. The Case Study of how the European Commission developed PEFCRs shows how guidance can be developed.

3.1.1. Case Study: development of Product Category Rules by the European Commission

In 2013, the European Commission (EC) launched the Environmental Footprint Rules pilot phase [4]. This initiative aimed at setting specific rules for life cycle assessment studies within one product category, so called product environmental footprint category rules (PEFCR), as well as for organisations, so called organisation environmental footprint sector rules (OEFSR). Such specific rules for measuring environmental performance throughout the life cycle facilitate the comparability between LCA studies, and provide principles for communicating the environmental performance, such as transparency, reliability, completeness, and clarity. These rules also make it easier for people to conduct an LCA as the rules provide guidance and help them with making choices and expert judgements. A key challenge has been to develop the understanding needed to provide detailed environmental data on the supply chain, use and disposal of a product.

The EC's Environmental Footprinting (EF) pilot phase has successfully ended in April 2018. Of the 27 pilot projects, 21 have defined their product environmental footprint category rules (PEFCRs) or organisation environmental footprint sector rules (OEFSRs) for the European market. Now, the PEF method is available for use by anyone who is interested. The pilot phase includes testing of the developed rules with at least three supporting studies per PEFCR/OEFSR.

In addition to developing PEFCRs and OEFSRs, the European Commission has used the pilot phase to develop the guidance for the implementation of the

EU Environmental Footprint for both products and organizations. This includes specific guidance for development of PEFCRs and OEFSRs [5]. The guidance documents complement – and sometimes even overrule - the PEF and OEF methods on specific topics, e.g. carbon modelling, use stage, hotspots analysis and data quality, that in the meantime were tested by the pilots. The pilot phase was also designed to test the development process of sector and category rules, different approaches to verification and communication vehicles for the results.

The pilot phase has resulted in:
- Clear guidelines for developing PEFCRs and OEFSRs;
- Secondary EF-compliant data and about 70 models used to define the representative products available for free;
- IT tools to perform PEF/OEF calculations for four product groups (development ongoing);
- Clear rules for PEF/OEF verification;
- Information on the effectiveness of the various communication vehicles.

This helps (new) LCA practitioners to conduct LCAs in a consistent way and makes it easier for them to get started with LCA.

3.1.2. Applying this key learning in Indonesia

Following the experience from PEF, it is important to develop similar harmonization in Indonesia through the introduction of category rules. Collaborative workshops with industrial associations, government, practitioners and LCA practitioners to develop category rules and a common method to harmonize any possible differences in value choices is required as well as to produce consistent, comparable results.

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[1] The "representative product" may or may not be a real product that one can buy on the EU market. Especially when the market is made up of different technologies, the "representative product" can be a virtual (non-existing) product built, for example, from the average EU sales-weighted characteristics of all technologies around. A PEFCR may include more than one representative product if appropriate [3].

3.2. Capacity building

Capacity building is the second key success factor. In order to assure that stakeholders and practitioners have sufficient knowledge and experience capacity building is an essential aspect to take care of. At universities a lot of knowledge is available, but in many cases additional efforts are needed to involve the private sector. Capacity building is an important factor to achieve that and a prerequisite to involve the private sector. Two audiences can be identified for this capacity building: 1) general stakeholders and 2) practitioners. For the first (and second) group knowledge sharing and awareness are key. For the practitioners a step further is needed; learning by doing is the way to gain the experience and expertise that is needed, supported by experts in the field that can guide and train them. This supports the growth of the number of LCA Practitioners. The Case Study of SwitchMed is an example of how this can be done.

3.2.1. Case study: Capacity Building in the Southern Mediterrean

The SwitchMed initiative, implemented by UNIDO and UNEP, is a program with the overall objective to facilitate the shift towards Sustainable Consumption and Production (SCP) in the Southern Mediterranean region. It provides all Mediterranean stakeholders with tools and connections to supporting partners for their social and eco innovations, to achieve productive, circular and sharing economies in the Mediterranean. One of the business networking activities of this initiative, carried out in Egypt, Lebanon, Morocco, and Tunisia, aimed at facilitating access of companies from this region to the outcomes of the Environmental Footprint Rules pilot phase by building capacity [6].

PRé was contracted to help raise the local awareness and build the local capacity. The project was composed of three consecutive phases:
(I) Awareness raising;
(II) Local pilots; and
(III) National dissemination events.

The awareness raising and technical workshop activities were meant to expose national stakeholders to the potential impact of the EF system for the national economies, specifically for industrial branches exporting to the EU market. Next, we assisted in the performance of nine environmental footprint studies for selected product categories (so-called 'PEF pilot studies'), which truly created local capacity and expertise. At last, the learnings from the pilot studies were shared in national dissemination events.

Phase 1: Awareness raising

In each of the four before mentioned countries, UNIDO organised an awareness raising event, where the potential policies and the consequences for

companies exporting to the EU were presented and discussed. Invitations were sent to representatives of relevant organizations (e.g. manufacturer and industrial associations, consumers associations, national standardization bodies, research and academia institutions), that will have an interest in promoting the adoption of environmental footprints, as well as interested companies from the four target countries, (e.g. export oriented companies) were identified. This awareness raising event was the start of a project in which a number of experts were trained in developing the Product Environmental Footprint, according to the (complex) rules and procedures.

Generic LCA training

Following the awareness raising event, there was a generic training on LCA. This introduction to LCA was given the day after the awareness raising session. Understanding this concept was of crucial importance as it is the basis for the PEF methodology. The generic LCA training covered:
Understanding the fundamentals of LCA;
) The ISO standards for LCA and environmental labelling [7];
) The goal and scope setting of an LCA study;
) The specific rules in the Product environmental footprint;
) Data collection and data quality consideration;
) Impact assessment and interpretation;
) Short exercise in small groups to report back what the participants thought about the implications of the PEF.

In-depth PEF training

The generic training was followed by an in depth PEF training for LCA experts. Interested LCA experts could apply to SwitchMed to become the local PEF expert in their country. The selected experts were trained in the specifics of the European methodology and the specifics of the product category selected for the shadow pilot.

Experiences

The trainings were well attended by a large group of interested people representing a wide range of relevant organizations. The selected LCA experts actually were not all experts, but nevertheless very eager to learn and participate. In fact, there were more sectors represented than would be selected for a follow-up pilot study (phase 2). The language was considered a practical disadvantage, and therefore some training materials were (upfront) translated.

Phase 2: Pilot studies

Together with companies from important export sectors to the EU market UNIDO proceeded with pilot studies that measured the impacts of the so far developed framework from the EU PEF methodology. These were leather and intermediate paper product for Egypt; two studies on wine and one on intermediate paper product in Lebanon; olive oil for Morocco; and pasta, olive oil and dairy for Tunisia. Currently, the trained experts are finishing a couple of pilot projects for product categories relevant for their country. The aim of these pilots is to provide the learnings for all companies within the same country that are exporting to the EU, and enable them to respond to these potentially important developments. The findings will eventually provide a feedback to the EU in the final revision phase of the methodology. Branding for sustainable products can play an important role in fostering environmental responsibility taking, both for consumers as well as for producers. But the introduction of the PEF methodology for Southern Mediterranean companies also enables producers to compete and see what needs to be improved in order to reach a similar competitiveness compared to European companies.

Phase 3: National dissemination events

In order to share the findings of the pilot studies on a national level, three dissemination events were held: in Egypt, Lebanon and Tunisia. The events focussed on the presentation of the national pilot study execution and outcomes, and targeted the same audience as the awareness raising workshops – i.e. primarily policymakers, cross-sector institutional stakeholders, LCA practitioners and industries. At each event between 80 and 100 people participated.

Unlike the starting events organised in 2017, where PRé introduced the concepts and trained the experts in sessions that required lecturing for over 18 hours in three days; during the final national dissemination events PRé only needed to provide a short overview and introduction. There, the local experts and companies presented their findings and took the lead in answering questions from the room. This shows that the objective of developing capacity has worked very well. The LCA and PEF discussions have become national discussions, which is a very positive result.

3.2.2. Applying this key learning in Indonesia

There are several key learnings that can be applied in Indonesia:

⟩ Aligning LCA perspective between existing LCA experts in Indonesia for all phases of LCA;

⟩ Defining common syllabus for teaching LCA, a.o. in universities;

⟩ Conducting training of trainers;

⟩ Collaborate with existing projects that are in line with LCA and the sustainable development goals to streamline efforts such as the Resource Efficient and Cleaner Production Expert Network.

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3.3. Focus on Business Value

A third key success factor is a focus on business value. Complying with regulation can be cumbersome and requires substantial investment of resources. If policy requirements remain "something we need to do" the effort can become a burden. However, private companies will be more motivated to act according to the requirements when it is clear what the business value will be. The benefits of doing an LCA thus have to be taken into consideration, made explicit and communicated to all relevant stakeholders. A nice example where this was done very well can be found in the Dutch Dairy Sector.

3.3.1. Case study: Dutch Dairy Sector

The The Dutch dairy sector has the ambition to reduce its greenhouse gas (GHG) emissions by 20 percent in 2020 and to achieve climate-neutral growth. Additionally, an increasing number of dairy processors in the industry are distinguishing themselves through sustainability and would like insight into the carbon footprints of their supplying farmers. To meet both objectives, Dutch dairy farmers wanted to measure their GHG emissions in a robust and quantitative way. All farmers in the Netherlands are already required by law to complete the Annual Nutrient Cycle Assessment (Dutch: KringloopWijzer calculation module), developed by Wageningen University [8]. The KringloopWijzer is an online tool that was built and paid for by the Dutch dairy sector, to facilitate compliance with the sustainable agenda of the Dutch government.

Dairy trade organisation Zuivel NL commissioned the integration of GHG calculations into the online KringloopWijzer tool, based on state-of-the art LCA standards. Thereby making environmental impact data and benchmarks available on sector and farmer level to stimulate more sustainable practices and reduction of the GHG emissions.

An integrated solution has been developed that enriches the sector-specific online KringloopWijzer tool, consisting of the Central Database and the methodological calculation module KringloopWijzer-with environmental data extensions to measure in a qualitative, robust way, the GHG-emissions of each farm and of the sector as a whole. The new GHG module uses a robust and highly parameterised LCA model, created by experts at dairy cooperative FrieslandCampina. The tool conducts more than 16,000 calculations per year.

The solution is unique as it combines expert knowledge with easy data input and results visualisation. This integrated solution has several benefits for the three main stakeholders.

Business Value for the Sector organization and Dairy companies

⟩ Evidence-based results at a large scale. The tool makes environmental impact results and benchmarks visually available at an unprecedented scale, with the ability to manage up to 36,000 requests per month. This level of scalability enables the calculation of sector benchmarks and the individual carbon footprints of all farmers in the Dutch dairy sector, which stimulates more sustainable practices and GHG emission reduction in the dairy sector;

⟩ Experts can analyse results at a meta level resulting in new insights, identification of fact based best practices and hotspots for improvement;

⟩ The integrated solution facilitates compliance and stimulates sustainable practices at a large scale, increasing the positive impact of a whole sector. It could be an inspiring example for other sectors as well.

Business Value for the Farmers

⟩ Insight into the influence of farm activities on global warming. The tool gives farmers insight into how much GHG is emitted when they produce 1 kg of milk and how much of these GHG emissions are related to: enteric methane emissions of the milk herd, Greenhouse gas emissions from manure storage, Emissions related to the production of purchased goods and Emission from roughage cultivation on the farm;

⟩ Accessible sector benchmarking. The tool also allows farmers to easily view their company's GHG emissions in comparison with similar dairy farms;

⟩ User independence through online user interface. Farmers can independently conduct their own robust carbon footprint calculations by using the one-portal online tool to enter their data and to

access a dashboard with their carbon footprint and sector benchmark scores.

⟩ By focusing on these business value the tool is used at a very large scale and the results can be used for further policy development, achieving footprint reduction and follow-up actions that reinforce sustainable practices.

The tool opens up LCA for the entire sector by enabling farmers to conduct their own robust assessment. Making the scaling up of LCA at unprecedented scale.

3.3.2. Applying this key learning in Indonesia

Through the 2018 International Conference Series on Life Cycle Assessment (ICSoLCA 2018) held in Jakarta, a workshop on identifying business value of LCA and sustainability was conducted. The workshop was organized by ILCAN and Forum for Sustainability through Life Cycle Innovation (FSLCI), and supported by the MOEF and Life Cycle Indonesia. The workshop was participated by companies in Indonesia that are interested to know more about LCA as an impact from the PROPER regulation. Similar workshops on identifying business value should be conducted for other business sectors.

3.4. Make it easy

Making it easy for – less seasoned – LCA Practitioners or even non-LCA Experts is the fourth key success factor. LCA requires in-depth expertise of both the product and LCA Methodology. With more and more guidance and PCRs available the process can be streamlined by providing a workflow driven tool that guides users through the process. If needed an expert could be consulted to support users with more advanced questions they might have. These workflow oriented tools focus on the input and output and thus create an intuitive user experience that makes it easy to deliver LCA results and reports. Especially when an expert module can be used with a dynamic connection to the easy interface. The tool BRE developed to facilitate the creation of LCA results for Environmental Product Declarations (EPDs) is an example of how the use can be made easy.

3.4.1. Case study: BRE LINA

BRE is the British building science center aiming to improve buildings and infrastructure through research and knowledge generation. Additionally, BRE is a significant and well-respected player in the environmental assessment of construction products BRE is a British organization that operates in 80 countries. They have developed widely recognised product category rules (PCR) for construction products, compliant with the EN 15804 standards [9]. The EN 15804 is the European standard with the core rules for environmental production declaration for the product category of construction products. BRE also helps trade organisations and companies with creating and verifying environmental product declarations (EPDs) that meet the EN 15804 standards, through BRE's EPD Verification Scheme.

Companies in the building sector are experiencing an increasing demand for EPDs for a growing number of their products. Most building companies using BRE's EPD Verification Scheme have limited experience with EPDs and Life Cycle Assessment (LCA), and often outsource the process to a consultant. Due to the increased demand, these companies increasingly view the EPD process as too time consuming and labor intensive. As a result, many members of the EPD Verification Scheme are looking for a quick, reliable and simple solution, a trustworthy system for carrying out their EPDs.

Easy to use solution

To meet this demand BRE developed, in collaboration with SimaPro, the automated online life cycle assessment tool BRE LINA. It is quick and easy to use and has an attractive interface. The tool generates life cycle assessment results for construction products in the format prescribed by EN 15804, which can then be used to create EPDs and do product evaluation and internal benchmarking.

BRE LINA guides businesses through all the steps of the EN 15804. Businesses can enter the data for different manufacturing sites and life cycle stages and upload relevant information such as a schematic of the production process. The tool is work flow driven and focuses on data input and results output. The underlying model is built and maintained by seasoned LCA Practitioners. BRE LINA automatically checks the mass balance and calculates all of the impacts required by EN 15804. This assures the quality of the outcomes as well as ease of use. Additionally, it enables online in-tool support from a consultant. BRE LINA is flexible in its architecture and design, allowing easy data upload and format changes for BRE. This ensures its longevity and usefulness to BRE and its clients.

The main benefits of this tool are:
⟩ it enables BRE's clients to easily calculate the LCA results for their EPDs; the tool is pre-verified according to EN 15804;

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⎫ A new and attractive industry-specific solution for BRE's clients, opening a new way to for BRE to strengthen the relationship with their clients;

⎫ A tool that enables construction companies to work more independently and efficiently while still being ensured of support from BRE and reliable LCA results.

3.4.2. *Applying this key learning in Indonesia*

The inclusion of LCA in the PROPER environmental performance rating will require extensive LCA capacity building within Indonesia, as well as a significant investment in time and money. The case-study of BRE shows how by developing a verified tool, the required level of capacity building and the investment for SME's can be reduced significantly. It demonstrates the importance of discussing how the PROPER assessment can be made accessible and affordable for the entire sector, and that automatization will likely play an important role in this

3.5. Discussion

The government has created the demand, now the supply has to be organized. That can be done by developing a program that provides:

⎫ Training for managers and policy makers to make them aware of what LCA can contribute to setting and achieving sustainability goals;

⎫ Introduction to LCA training for practitioners to increase the available capacity for conducting LCAs;

⎫ Learning by doing with screening LCAs to put the learnings into practice and to get hands on feedback on the work done;

⎫ Facilitate easy to use tools to further scale up the efforts of conducting LCAs and to leverage the expertise and experience of both the LCA practitioner and the product experts;

⎫ Develop PCRs to provide further guidance on how LCAs have to be conducted;

⎫ Create a label or other verified report/certificate to reward the efforts and to increase the benefits for the companies participating.

4. CONCLUSIONS

Indonesia faces a huge challenge, but has been brave to implement this new policy to make business practices more sustainable. In this article four clear key success factors have been identified and illustrated how Indonesia can prepare and scale up for the PROPER requirements and similar legal demands. These learnings from other regions around the world can give Indonesia and its LCA practitioners a head start in implementing and embedding LCA in policy implementation and compliance by private companies.

To embed it in daily practice local stakeholders have to be involved in those next steps. One or two success stories can accelerate the development as that would make them enthusiastic as it shows them what they can do and how they can benefit.

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