

# Cleaner production and energy management in Sri Lanka

## National Cleaner Production Center Sri Lanka

<http://www.ncpcsrilanka.org>

### Resource efficient cleaner production assessment

There is greater recognition that the inefficient and at times wasteful use of natural resources, including energy, water and materials, lies at the heart of the key environmental challenges, including climate change. Resource Efficient and Cleaner Production (RECP) assessments is a tested and proven tool adopted globally in past two decades to identify and quantify such resource productivity issues at firm level and to develop technically, financially and environmentally feasible solutions to the organizations.

RECP assessments analyses and quantifies input, output and waste generation at each step of a production process to increase efficiency and reduce risks to humans and the environment.

RECP addresses the three sustainability dimensions individually and synergistically:

- **Production Efficiency:** optimization of the productive use of natural resources (materials, energy and water);
- **Environmental management:** optimization of the productive use of natural resources (materials, energy and water);
- **Human Development:** minimization of risks to people and communities and support for their development.

RECP is a tool developed and promoted globally by United Nations Environmental Programme (UNEP) and United Nations Industrial Development Organization (UNIDO) since 1994 and it has caused incomparable savings in resources at firm level across the various industrial sectors during last two decades. National Cleaner Production Centre (NCPC) as the apex body in Cleaner Production has conducted Cleaner Production Assessments in hundreds of industrial organizations in past one and half decades and paved the way for the savings of millions of rupees via efficient use of resources for the companies while enabling them to meet stringent compliance obligations.

There are three types of audits focuses on improving resource efficiency:

**Comprehensive cleaner production assessment:** A Comprehensive Cleaner Production Assessment is an in-depth assessment carried out in an organization focusing at resource flows (energy, water and materials) within the total process in order to identify waste generation sources and causes. It also involves carrying out measurements in order to develop an accurate understanding of what, where and how waste is being generated. At the end of the assessment a detailed audit report is presented to the company listing out prioritized Cleaner Production solutions with the feasibility evaluation for waste minimization.

**Short CP assessment:** Short CP assessments are conducted with limited detailing in resource flow analysis. However Cleaner Production solutions are provided with feasibility evaluation in the shorter duration of assessment.

**Walk through assessment/Quick scan assessment:** A Walk-through Audit (Quick scan) assessment is a tool to identify resource inefficiency hotspots in an organization and make recommendations with analysis of available data. It is usually conducted during a span of 2–3 hours to familiarize oneself with the processes and activities being carried out.

### Energy Consultancy/Auditing

Being an Energy Services Company (ESCO) registered under Sri Lanka Sustainable Energy Authority (SLSEA) since the inception of ESCO system in Sri Lanka, NCPC has been expertized to offer customized energy auditing services to any industry sector.

Energy Audit attempts to balance the total energy inputs with its use and serves to identify all the energy streams in the systems and quantifies energy usage. Energy Audit helps in energy cost optimization, pollution control, safety aspects and suggests the methods to improve the operating & maintenance practices of the system. With a strong dedication to providing commissioning, an energy consulting and sustainability service, NCPC has successfully consulted on over 100s of detailed energy audits and assessments.

The energy audits provide with a clear understanding of energy consumption in your buildings and facilities. Quantitative findings can provide substantial practical guidelines for:

- Continuous improvement in production efficiency
- Identifying cost saving opportunities in energy efficiency
- Identify fast-payback energy retrofit opportunities
- Make well-informed decisions on capital investments in your industry
- Identify low-cost/no-cost O&M measures that have an immediate impact
- Develop integrated capital improvement programs that coordinate energy

Starting with the development of an energy consumption inventory detailed auditing activities will be conducted to identify buildings and facilities with particular focus on rationalizing their energy profiles. Field measurements will be also taken to quantify critical operating parameters. Following the establishment of an energy consumption profile, the potential energy saving

opportunities can be identified. NCPC-SL equipped with latest energy measuring instruments including power analyzers, flue gas analyzers, Infrared thermometers and etc.

The type of industrial energy audit conducted depends on the function, size, and type of the industry, the depth to which the audit is needed, and the potential and magnitude of energy savings and cost reduction desired. Based on these criteria, an industrial energy audit can be classified into following types:

**Preliminary Energy Audits:** Primary energy assessments conducted in short time period based on history data and key instant measurements to identify general energy saving potentials.

**Detailed Energy Audits:** More comprehensive results and accurate picture of industry energy consumption is given by detailed energy audit since it based on continuous recorded measurements and more history data.

**Customized Energy Services:** Apart from standard energy audits, following specific energy services are offered by NCPC

- Demand analysis for tariff changes
- Power factor analysis for corrections
- Equipment efficiency analyze
- Illuminance level analysis for light replacements/daylight utilization

- Heat load calculations for chiller installations, replacements
- Building management systems and energy management systems
- Fuel switching consultancy

### Measuring and verification

NCPC offers customized third party measuring and verification services for specially energy saving implementations to understand the actual energy and monetary savings of particular installation respected to baseline data.

NCPC Sri Lanka, is closely partnered with other RECP members of the RECPnet, who are rich in wealth of experience in respective countries. Hence, we maintains easy access to additional capacity and resources whenever necessary to provide a specific service beyond the capacity of us and the country. NCPC energy audit services provide a range of additional benefits. The findings of an energy audit can be a good reference for your management in supporting commercial decisions. You can acquire a sustainable reputation with your customers. As the law or policy for energy efficiency will be enacted sooner or later; earlier preparation can enhance your competitiveness. A diverse range of industries have already experienced improved energy and production efficiency following our energy audit services.

### Study on Value of "Intangible Capital" in Manufactured Goods

The "World Intellectual Property Report 2017: Intangible Capital in Global Value Chains" (WIPR 2017) looks at how much income accrues to labor, tangible capital and intangible capital in global value chain production across all manufacturing activities, representing one quarter of total global economic output, with case studies focusing on coffee, solar panels and smartphones. It examined national accounts and international trade statistics from around the world and company data to provide these economic insights.

The figures reveal that nearly one third of the value of manufactured products sold around the world comes from "intangible capital," such as branding, design and technology, according to a World Intellectual Property Organization (WIPO) study of the global value chains companies use to produce their goods. This amount, some USD 5.9 trillion in 2014, shows that intangible capital contributes twice as much as buildings, machinery and other forms of tangible capital to the total value of manufactured goods. This underscores the growing role of intellectual property, which is frequently used to protect intangible and related assets in the worldwide economy.

Some WIPR 2017 findings

- Intangible capital accounted, on average, for 30.4 percent of the total value of manufactured goods sold throughout 2000-2014.
- The intangible capital share rose from 27.8 percent in 2000 to 31.9 percent in 2007, but has remained stable since then.
- Overall, income from intangibles increased by 75 percent from 2000 to 2014 in real terms, amounting to USD 5.9 trillion in 2014.
- Three product groups – food products, motor vehicles and textiles – account for close to 50 percent of the total income generated by intangible capital in the manufacturing global value chains.

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# Cleaner production

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Used in conjunction with other elements of environmental management, cleaner production is a practical method for protecting human and environmental health, and for supporting the goal of sustainable development.

Production with no regard for environmental impacts creates water and air pollution, soil degradation, and large-scale global impacts such as acid rain, global warming and ozone depletion. To create more sustainable methods of production, there needs to be a shift in attitudes away from control towards pollution prevention and management.

The United Nations Environment Program (UNEP) introduced the concept of cleaner production in 1989, and defined it as 'the continuous application of an integrated preventive environmental strategy applied to processes, products and services to increase eco-efficiency and reduce risks to humans and the environment'.

Cleaner production activities include measures such as pollution prevention, source reduction, waste minimization and eco-efficiency. They involve better management and housekeeping, substitution of toxic and hazardous materials, process modifications, and reuse of waste products. At its heart, the concept is about the prevention, rather than the control, of pollution.

The concept of cleaner production questions the need for a particular product, and looks at other ways to satisfy the demand. It is a slowing down of the rate at which we use resources, and a gradual shift from linear to more circular processes, similar to those found in nature. The eventual goal of clean production is to achieve a 'closed loop' operation in which all excess materials are recycled back into the process.

The four elements of cleaner production are:

1. The precautionary approach: potential polluters must prove that a substance or activity will do no harm;
2. The preventive approach: preventing pollution at the source rather than after it has been created;
3. Democratic control: workers, consumers, and communities all have access to information and are involved in decision-making;
4. Integrated and holistic approach: addressing all material, energy and water flows using life-cycle analyses.

The benefits of cleaner production include decreased waste, the recovery of valuable by-products, improved environmental performance, increased resource productivity, increased efficiency, lower energy consumption, and an overall reduction in costs.

Implementing cleaner production can be as straightforward as adopting better housekeeping practices, or it may involve more complex measures associated with processes and products. The more sophisticated options may include switching to renewable energy sources, increasing material efficiency, and re-using and recycling by-products. The product itself can be designed to reduce consumption of resources, to prolong its useful life, and to allow disassembly and recycling of its component parts.

Cleaner production requires a new way of thinking about processes and products, and about how they can be made less harmful to humans and the environment. For successful implementation, the concept must be effectively communicated within the organization. Employees at all levels, including senior management, should be actively involved.

The following guidelines can be used to implement a cleaner production approach:

1. Identify the hazardous substance to be phased out, on the basis of the precautionary principle;
2. Undertake a chemical/material flow analysis;
3. Establish a time schedule for the phase-out of the hazardous substance in the production process, as well as its accompanying waste management technology;
4. Implement and further develop cleaner production processes and products;
5. Provide training and technical and financial support;
6. Actively disseminate information to the public and ensure their participation in decision-making;
7. Facilitate substance phase-out with regulatory and economic incentives;
8. Facilitate the transition to cleaner production with social planning, involving workers and communities affected.

The cost of complying with environmental legislation can be significantly reduced by companies that adopt cleaner production techniques. The latter are often more cost-effective than control technologies. The costs of dealing with wastes are reduced, and there is potential for new markets to be discovered through innovations or the sale of by-products.

Cleaner production can reduce environmental risks and liabilities and lead to greater competitiveness. By demonstrating a commitment to cleaner production, companies can also improve their public image and gain the confidence of consumers.