

## **Terms of Reference for Consultancy Assignment**

### **"Best Practices and Case Studies for Industrial Energy Efficiency Improvement"**

#### **Background**

The Copenhagen Centre on Energy Efficiency (C2E2) is part of the UNEP-DTU Partnership (UDP), a collaboration between the Denmark Government, the United Nations Environment Program (UNEP) and the Technical University of Denmark (DTU). The C2E2 is located in the UN City in Copenhagen, Denmark, and serves as the Energy Efficiency Hub of the Sustainable Energy for All (SE4ALL) initiative.

Sustainable Energy for All (SE4ALL) initiative is a multi-stakeholder partnership between governments, the private sector, and civil society. The SE4ALL Initiative was launched by the United Nations Secretary General in 2011 to achieve three interrelated goals by 2030:

1. Ensure universal access to modern energy services;
2. Double the share of renewable energy in the global energy mix from 18% to 36%;  
and
3. Double the rate of improvement in energy efficiency from -1.3% to -2.6% annually.

In order to facilitate the realisation of the SE4ALL goal on energy efficiency, C2E2 provides capacity building, analytical, and knowledge support to countries in actions improving their energy efficiency.

#### **Context and Rationale of the Book 'Best Practices and Case Studies for Industrial Energy Efficiency'**

Industrial development has had an important role in the economic growth of countries. It is critical to national material wealth creation and accumulation, the increase of national productivity, job creation, as well as income increase and the reduction of poverty. They produce goods and products for domestic consumption and international trade. Industrialisation is an important phase in a country's development. The rise of industry in national economy transfers a country from a traditional agriculture-based economy and society into a modern economy and society. The efficiency of mass production based on machinery improves product quality and labour productivity. In developed countries, despite the fact that service sector is often the most important economic sector in terms of GDP contribution and employment, domestic industrial production still plays an important role in satisfying domestic demand for industrial goods and contributing to export. In emerging countries that are going through industrialisation, industry is often the most important economic sector and can contribute to almost half of national GDP and national employment.

Industry is responsible for more than one third of global primary energy consumption and energy-related carbon dioxide emissions. Industrial energy use is estimated to grow at an annual rate of between 1.8 per cent and 3.1 per cent over the next 25 years. In developing countries and countries with economies in transition, the portion of energy supply

(excluding transport) required for industry can be much higher. For example, industry accounted for 63% of China's total primary energy consumption in 2012.

This often creates tension between economic development goals and constrained energy supply. Improving energy efficiency in industry is one of the most cost-effective measures to help supply-constrained developing and emerging countries meet their increasing energy demand and loosen the link between economic growth and environmental degradation, such as climate change. Compared with households and service businesses, industrial sector's energy consumption is more concentrated in terms of entity numbers and often a small number of the big industrial enterprises in energy-intensive sectors consume the majority of the industrial energy consumption. They are often targeted in national policies for energy efficiency improvement and greenhouse gas emission reduction. How to effectively support small and medium-sized enterprises (SMEs) for energy efficiency improvement is a challenge facing most developing countries.

Worldwide, the efficiency with which industry uses its energy is well below the technically feasible and economic optimum. It has been estimated that industry has the technical potential to decrease its energy intensity and emissions by up to 26 per cent and 32 per cent providing a striking 8 per cent and 12.4 per cent reduction in total global energy use and CO<sub>2</sub> emissions (IEA).

To realise the SE4ALL target of doubling global annual energy efficiency improvement by 2030, it is important to eliminate the various barriers and unlock the huge potential of industrial energy efficiency improvement. To do this in the most cost-effective way, it is imperative to identify and summarise best practices of barrier elimination and industrial energy efficiency promotion based on concrete examples and case studies.

## **The Assignment**

### ***Objective***

The objective of the assignment is to develop a best practice guidebook to support industrial energy efficiency improvement in energy-intensive sectors. The best practice recommendations should be practical and clear, including preconditions for the best practices to work, tips about measure/policy/program/project design and implementation, as well as pitfalls that should be avoided. Each practice should be followed with one or two concrete case studies or examples.

The guidebook should be a practical tool to be used in a developing country context. It should also highlight key experiences and gaps in knowledge where relevant. In terms of language and style, the guidebook will avoid unnecessary theoretical discussions and minimise the use of jargon to technical terms commonly understood in the water sector.

### ***Target audience***

The guidebook should assume that the target audience has minimal understanding of industrial technology details and make every effort to be clear and self-explanatory. The reader should be able to understand the concepts used in the guidebook without prior extensive knowledge of other reading materials. Thus the guidebook should lay the groundwork for basic concepts and gradually take the reader through higher levels of complexity. Essential technical terms specific should be explained in a glossary.

The guidebook will be distributed through the SE4ALL energy efficiency knowledge platform and used as capacity building materials in C2E2 national and regional capacity building events.

### ***Dissemination***

The guidebook would be published and print copies would be distributed at the capacity building workshops organised by C2E2, the online versions would also be made available over the C2E2 website and relevant SE4ALL partners.

### ***Duration***

The duration of the assignment is five months from contract signature. A first draft will be submitted by the middle of the fourth month.

### ***Deliverables***

1. A summary contents and revised table of outline for the book based on but not limited to the suggested Outline in this ToR;
2. Draft of the guidebook submitted for C2E2 review and approval;
3. Revise the draft based on the comments and feedbacks from C2E2 experts and/or external reviewers;
4. Final draft incorporating C2E2 comments submitted for approval.

### ***Size of the guidebook***

The size of the Guidebook will be slightly bigger than half of an A4 piece of paper. It will consist of around 120 – 140 pages. In terms of English words, they shall be around 50,000 to 60,000 words excluding graphs and figures. They will look similar to the existing UDP TNA guidebooks, which can be found at: <http://www.tech-action.org/Publications>.

### ***Co-authoring from C2E2***

Based on the final and agreed table of contents, C2E2 will discuss with the consultant about C2E2 experts' contribution to certain sections or chapters of the book.

### ***Budget***

For the preparation of this book, the C2E2 makes available a maximum budget of US\$ 25,000 for paying the consultant.

### ***Implementation Schedule***

The book will be released as a UNEP SE4ALL publication at COP 21 in Paris (30 Nov - 11 Dec, 2015).

Item	Activity	Schedule
1	Deadline for individuals/organisations to submit to C2E2 expression of interest, list of past publications/projects on the topics, as well as a 2-page contents based on the outline	28 June 2015

	and objectives of the publication for comments and approval	
2	Consultant selection, table of contents finalisation and signing contract	10 July 2015
3	Submission of list of best practices and case studies that would be developed	5 Aug. 2015
4	1 <sup>st</sup> draft of the complete book to C2E2	15 Oct. 2015
5	External reviewer comments on 1 <sup>st</sup> draft	30 Oct. 2015
6	Submission of the revised and final draft	10 Nov. 2015
7	Publishing of the book by C2E2	20 Nov. 2015

### **Focal area selection**

Industry is a broad sector and includes multiple segments, such as energy intensive industries and non-energy intensive industries, big enterprises and SMEs. C2E2 is interested in focusing this publication on either best practices for SMEs or best practices for energy intensive industries. Interested expert/institution needs to indicate the focal area in their proposal. C2E2 will select one focal area and one authoring proposal for now and proposals on the other focal area will be taken into account for future publication preparation. Reviewers will also be selected for reviewing the drafts.

Below are some general ideas about the guidebook, and the consultant needs to submit a detailed table of contents and summary of contents based on but not limited to the Outline in their proposal.

### **Outline**

1. Summary
2. Introduction and outline of the book
3. Background: the role of industry in energy consumption and energy efficiency improvement
4. Definition and typology of energy efficiency improvement in industry
  - a. *Best Practices*
  - b. *Case Studies*
5. Description of around 6 best practices for supporting industrial energy efficiency improvement

(topics of the best practices can include but not limited to the following)

- Financing of energy efficiency activities
- Energy Efficiency Improvement vs Competitiveness
- Rebounding Effect
- Monitoring and assessing energy efficiency improvement benefits

- Energy management system
- Voluntary agreement
- Mandatory energy efficiency targets
- ESCOs

*For each best practice, follow the structure of:  
(issues/barriers, best practice summary, one or two case studies (concrete examples),  
tips and cautions for policy makers or energy efficiency promoting organisations and  
industrial enterprises (Preconditions for the best practice to work effectively and key  
factors/elements that may affect the effectiveness of this best practice)*

6. Conclusions
7. References
8. Glossary of technical terms
9. Additional sources of information on base practices