

ADAPTATION TO CLIMATE CHANGE THROUGH ECO-EFFICIENCY: OPPORTUNITIES AND CHALLENGES FOR TURKEY

Ferda Ulutaş¹, Emrah Alkaya¹, Göksel N. Demirer²

¹ Technology Development Foundation of Turkey (TTGV), Bilkent 06800 Ankara, Turkey,

² Middle East Technical University (METU), Department of Environmental Engineering, 06531 Ankara, Turkey

“MDG-F – 1680: Enhancing the Capacity of Turkey to Adapt to Climate Change” United Nations (UN) Joint Programme



In order to establish the necessary strategies and enhance institutional capacity for Turkey to combat and manage the effects of climate change, a United Nations Joint Programme titled “Enhancing the Capacity of Turkey to Adapt to Climate Change” was initiated. The Joint Programme aims to integrate the climate change adaptation into national, regional and local policies within the framework of future development targets of Turkey in terms of sustainability. The project aims to achieve its goal through:

- Mainstreaming climate change adaptation in Turkey’s national plans and developing a Climate Change Adaptation Strategy
- Developing national and regional institutional capacity in order to predict and manage risks induced by uncertainties caused by climate change and climatic conditions
- Implementing community-based pilot projects in the Seyhan River Basin
- Mainstreaming climate change adaptation into UN programming framework in Turkey

Executing UN Agencies of the Joint Programme:

- United Nations Development Programme (UNDP) – Main Implementer Agency
- United Nations Environment Programme (UNEP)
- United Nations Industrial Development Organization (UNIDO)
- Food and Agriculture Organization of the United Nations (FAO)



UNIDO Eco-efficiency (Cleaner Production) Programme



The industry component of the Joint Programme, namely “UNIDO Eco-efficiency (Cleaner Production) Programme” is being carried out by United Nations Industrial Development Organization (UNIDO) and Technology Development Foundation of Turkey (TTGV) with the consultancy of Prof. Dr. Göksel N. Demirer (Middle East Technical University) in the Seyhan River Basin Area (Adana, Kayseri and Niğde).

The main objective of “UNIDO Eco-efficiency (Cleaner Production) Programme” is to foster the implementation of Eco Efficient Production (EEP) and Environmental Sound Technologies (EST) in the Turkish manufacturing industry through national capacity building, pilot (demonstration) projects and dissemination of the results achieved in the Seyhan River Basin Area. The programme also involves the establishment of a National Eco-Efficiency (Cleaner Production) Centre.

Within the scope of the Programme 6 pilot projects, focusing mainly on water saving, are being implemented in the manufacturing companies in priority sectors (Food/Drink, Chemical, Textile/Tanery, Metal/Machinery), determined by taking several environmental and economical parameters into account.

Eco-efficiency Pilot Projects in Priority Sectors



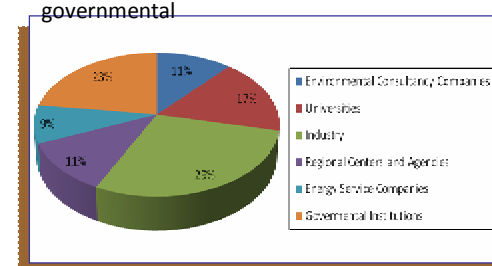
Within the scope of the programme 6 companies were determined by a series of activities consisting of local information campaigns, questionnaires, face to face meetings and company visits. So far, three pilot projects were implemented in companies from food, drink and metal industries in Adana, Kayseri and Niğde, three cities located in Seyhan River Basin. In the remaining three companies projects are still being developed.

First project was implemented in a sea food manufacturing company of which anchovy processing is one of the main activities contributing to 42,000 m³/year water consumption, 47% of total water consumption of the company. The project aims to reduce water consumption via two separate treatment/recycling systems, designed respectively for thawing and gutting (filleting) lines in anchovy processing. For both of the lines treatment/ recycle systems composed of combination of screening, sedimentation, floatation and ozonation processes. These measures are expected to result in an overall water saving of 35–40 % when total annual water consumption

of the firm is taken into consideration. This amount accounts for annual water saving of 30,000 – 35,000 m³. During monitoring stage of the project water saving figures as well as other gains will be monitored and recorded accordingly.

Training Seminars for National Experts

A two stage training programme was organized to build national capacity on eco-efficient (cleaner) production by sharing technical knowledge with potential national experts. First stage (eco-efficiency basics) was delivered by the consultant of the programme, Prof. Dr. Göksel N. Demirer from Environmental Engineering Department of Middle East Technical University. The content of the first stage covered the UNIDO Toolkit in general. The aim of this stage was formulated to give an insight into cleaner production. It composed of basic concepts on cleaner production; steps of waste reduction audits, theoretical applications, case studies etc. 68 participants were trained at this stage within 2-day schedule. The target group of the training composed of representatives from environmental consultancy companies, universities, industries, organized industrial zones, sectoral institutions, regional centers and agencies, energy service companies and relevant units of the institutions. Second stage of the training was delivered in cooperation with Resource Efficiency Center (EFA), Duisburg, Germany. This stage focused on firm-level applications. A comprehensive cleaner production opportunity assessment methodology was shared with 25 trainees selected among the participants of the first training. Being a 3-day training program this stage included a site-visit for firm-level assessment in a metal processing and painting plant in Ankara followed by group discussions and presentations.



Adaptation of Industrial Enterprises to Climate Change

From its inception, the international climate effort has focused predominantly on mitigation. The next stage of the international effort must deal squarely with adaptation—coping with those impacts that cannot be avoided. Adapting to these impacts in order to minimize their human and environmental toll is a significant challenge for all sectors. While some sectors are particularly at risk, all businesses face the possibility of property damage, business interruption, and changes or delays in services provided by public and private electricity and water utilities, and transport infrastructure.

A more strategic and long-term approach for managing climate change risks will be necessary for all sectors including manufacturing industry. There are many adaptation options available to reduce the vulnerability of sectors. Eco-efficiency which is based on the concept of creating more goods and services while using fewer resources and creating less waste and pollution is one of these options that manufacturing industry can apply for adaptation purposes.

Along with other resources, water is expected to become scarce directly affecting the competitiveness of industries, highly depending on it. In other words, industrial enterprises should take serious measures to decrease their resource intensity including water intensity by applying eco-efficiency methodology. So, “UNIDO Eco-efficiency (Cleaner Production) Programme” was launched, focusing on industrial enterprises, as part of the efforts devoted to climate change adaptation.



National/Local Awareness Raising Activities on Eco-efficiency

One of the main objectives of the Programme is to raise awareness on eco-efficiency. Owing to this, local and national level awareness raising meetings were organized. Local meetings were held in each of the cities in Seyhan River basin, namely Adana, Kayseri and Niğde. Main target group of these 3 meetings were industrial enterprises, since they are among major stakeholders of the programme. In addition, representatives from industry were informed about upcoming pilot projects, backbone of the programme. After local level meetings, a national meeting was held in Ankara. Besides industrial enterprises; governmental institutions, non-governmental organizations and sectoral associations paid attention to the national awareness raising meeting. As a result of the meeting:

- Local/national level stakeholders were informed about the UN Joint Programme “MDG-F 1680: Enhancing the Capacity of Turkey to Adapt to Climate Change”
- The stakeholders were informed about the UNIDO mission and Eco-efficiency Programme
- The industrial sector was informed about the case studies and the upcoming pilot projects
- Awareness was raised to an extent on eco-efficiency and cleaner production at both local and national level



Eco-efficiency Pilot Projects in Priority Sectors (Cont'd)

Second project was implemented in a company from drink industry which had water consumption of 750,000 – 850,000 m³/year prior to the applications. Before the project, there were two separate water supply systems in operation for cooling of equipments which use groundwater once-through without any recycle/reuse. These systems were in operation for fruit processing and soft drink production lines which are the two major operation lines of the facility. Implemented technologies composed of two separate recirculating cooling systems including cooling towers with different capacities. As a result of this recent project it is expected to save 80 % of total cooling water which accounts for 350,000 – 400,000 m³/year.

Third project was implemented in a company producing metal components for automotive industry. The company uses fresh groundwater in production processes. In heat treatment line cooling was performed by means of continuous supply of groundwater without reuse/recycle. First part of the project was realized to recycle the cooling water to the main water tank, currently used for process water supply of the whole factory. Second part consisted of optimization/ good housekeeping practices in the surface finishing line. As a result of these applications 15,000 m³ water is expected to be saved.



Establishment of National Cleaner Production Center

Establishment of National Eco-efficiency (Cleaner Production) Center is expected to be one of the main outcomes of the Programme. TTGV, as the implementing agency of the Programme, is suggested as the host institution of the Center. Executive and advisory (technical support) councils are planned to be the other bodies of the Center. The main objective is to incorporate all relevant institutions and experts into the system and achieve to sustain an efficient collaboration and coordination among the parties. TTGV is assumed to be a flexible and dynamic interface between relevant stakeholders.

While developing the model, other international cases including examples from different countries have been studied and relevant guidelines reviewed. An appropriate synthesis was created taking into consideration the cultural characteristics as well as existing capacity and needs. It is further planned to carry out cooperation and knowledge exchange programs with other National Cleaner Production Centers in the world.

The Center is expected to coordinate and support the activities in relation to following points at National Level:

- Creating awareness
- Generating capacity
- Forming partnerships
- Information sharing mechanisms
- Financial mechanism
- Political reforms

ACKNOWLEDGEMENTS:

UNIDO Eco-efficiency Programme is being carried out as a sub project of “MDG-F – 1680: Enhancing the Capacity of Turkey to Adapt to Climate Change” financed by Millennium Development Goals Fund (MDGF).

1 - Ferda Ulutaş & Emrah Alkaya

E-mail: cevre@ttgv.org.tr
Tel: +90 312 265 02 72
Fax: +90 312 265 02 62

2 - Prof. Dr. Göksel N. Demirer:

E-mail: goksel@metu.edu.tr
Tel: +90 312 210 58 67
Fax: +90 312 265 02 62