Harnessing Municipal Waste of big Cities of Pakistan to Generate Electricity

NAMA Profile # 1 | *Seeking support for preparation* | *May 2015*

With a population of approximately 180 million, Pakistan is ranked as the 2nd and 6th largest country in South Asia and the world, respectively. Approximately 35% of the country's population lives in urban areas and produces around 55,000 tons of solid waste per day [1]. However, cities in Pakistan lack sufficient financial, managerial and technical capacity for the collection, transfer and disposal of generated waste. According to one estimate, around 40% of generated waste remains uncollected in major cities [2]. Disposal of waste in open areas and poorly designed landfill sites result in many negative social, economic and environmental consequences, including methane generation, contamination of ground and surface water sources, spread of diseases and a degraded aesthetic value of urban areas.

With Pakistan's population expected to reach 350 million by 2050 [3], waste-related greenhouse gas (GHG) emissions are expected to rise from six to 15 million tCO2 eq in this timeframe [4]. The potential emission reductions from this sector total around three million tCO2 eq annually.

Source : The Express Tribune

NAMA description

This NAMA aims to develop regulatory, legislative and financial instruments for developing and promoting municipal waste management systems, and deploying them for energy generation. It also has the objective of encouraging and helping the financial sector provide finance for end customers through soft loan schemes so that they are able to cover initial higher capital costs for installing waste-to-energy (WtE) power plants.

Waste to energy – win win approach

Biomass/WtE technology can offer two-fold services: first, it can generate clean energy out of wastes in specially designed power plants; and, second, it can improve solid waste management conditions in urban areas. Depending on the composition of WtE material, power plants can be designed with the capacity to process 1-1500 tons/day of hospital waste, municipal solid waste, industrial effluents, industrial waste, mixed waste plus tires, mixed waste plus dried sewage sludge, and crop and biomass residues. In addition to power generation, the plants can also produce high-grade organic fertilizer.

During the past five years, Pakistan has faced significant electricity shortages due to a growth in demand, lack of additional generation capacity and high systems losses (generation, transmission and distribution). The energy crisis is constraining the country's economic growth due to a reduction in production activities in the industrial sector. Distributed energy generation facilities, equipped with WtE technology, will help to ease the problems caused by the energy crisis.

Intended impact and output

This NAMA will facilitate the development and promotion of the WtE market in Pakistan by: enabling better access to available financing for WtE projects; and smoothing the way for integrating 0.5-0.8 GW WtE power into its national energy mix in order to contributing to the three million tCO2 eq annual emission reduction. Furthermore, the proposed project will assist cities with efficient waste collection and disposal practices to ensure a cleaner and healthier Pakistan.

Potential for transformational change and sustainable development benefits

This NAMA is likely to provide a valuable contribution in paving the way for promoting and developing not only the WtE sector, but also an efficient waste collection and disposal system. Development of WtE power projects will lead to achieving the goals of sustainable development, self-reliance and self-sufficiency in meeting the energy needs of end consumers and promoting clean energy sources. Some of the anticipated co-benefits of this NAMA are that:

- Cities will be best equipped to collect, transfer and dispose of municipal solid waste in an efficient manner;
- Social, economic and environmental impacts of haphazard waste disposal will be avoided, thus resulting in a cleaner and healthier Pakistan and an improved quality of life;
- A greater market demand for biomass/WtE technology will be created, thus providing an avenue for private sector engagement in mitigation actions, resource recovery and more jobs;
- An opportunity will be provided to develop national capacities regarding clean energy generation technology;
- It will contribute to the country's energy independence and ease the energy crisis through access to affordable, sustainable and clean energy; and
- Agricultural productivity will increase through the use of organic fertilizer and reduced dependency on chemical fertilizers.

Relevancy of the NAMA in the national policy context

The proposed NAMA is in line with the national policies and plans outlined below:

- The Waste Management Guidelines (2005), which suggests recovery of every capturable component from waste, including energy generation;
- The National Climate Change Policy (2012), which guides the implementing agencies to productively use the waste collected, including energy generation from waste for multiple uses;
- Policy of Development of Renewable Energy for Power Generation (2006), which aims to attract private sector investment for developing clean power;
- The Power Policy (2013), which emphasizes the development of alternative renewable energy sources for providing inexpensive and clean electricity to every household in Pakistan, with the intention of reducing emissions.

Source : wastebusters.com.pk/waste-busters-services

Establishing a revolving loan fund to attract and engage private sector

This proposed NAMA plans to create a revolving loan fund that allocates €10 million to the public and private sectors in the pilot projects, so that they can: undertake municipal solid waste management and WtE programmes; and address the high cost of transitioning to efficient solid waste management and WtE systems. This initial pilot project funding will help to overcome the financial and technological barriers for the deployment of such interventions. Through an investment of slightly more than €20 million, this NAMA will trigger an estimated investment of €3 billion from the private sector by 2020. The private sector investment can increase more as time passes and end consumers adopt such options in different sectors of the economy.

Salient features of the Proposed NAMA

Sector : Waste management

Technology : WtE

Type of action : Strategy, National/ Sectoral policy or program

GHGs covered by the action : CO2 and CH4

Expected timeframe for the preparation : 3 years

Implementing entity : Alternative Energy Development Board, Ministry of Water and Power

Total estimated cost of the action : €20 million

Required support for the preparation of the action : €20 million

Relevant contacts

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