2.3.4. Recommended solutions

In accordance with the analysis of barriers and attempt to overcome the barriers, there are several recommendations proposed as follows:

- There is a need in implementing related and follow up regulations of solid waste management act.
- There is a need of privatization of solid waste treatment operation.
- There is a need to increase cross-sectoral coordination in solid waste management.
- It should be issued a tax reduction of imported waste treatment components.
- There should be a regulation on tax reduction, investment subsidy, and cost reduction.
- There should be national standards imposed for mechanical biological treatment, in-vessel composting, or low-solid anaerobic digestion technology.
- There should be R & D on mechanical biological treatment, in-vessel composting, or low-solid anaerobic digestion to improve national capacity on that area.
- There is a need to improve the ability of negotiation for solving the IPR barrier.
- There is a need to socialize this technology to communities.

2.3.5. Concrete actions plans and ideas

2.3.5.1. Plans for domestic actions and measures

Description

The establishment of demonstration plant of intermediate treatment facilities can be chosen from one of the following selected technologies: mechanical biological treatment, in-vessel composting, or low-solid anaerobic digestion. This application depends on the technology transfer agreement between owner from foreign country and user from Indonesia. However, a mechanical-biological treatment (MBT) is considered to be the best choice because it can actually be combined with an in-vessel composting technology or a low-solid anaerobic digestion as a specific treatment of organic waste contained in MSW. Therefore, MBT can be an alternative option to overcome the garbage problems faced by Indonesia urban cities at small, medium or large scales.

MBT application has already been raised to be implemented in several cities of Indonesia that is in line with the national waste management program initiated by Ministry of Public Works as the implementing agency. The Ministry of Public Works together with foreign partner has already initiated cooperation with local governments to implement this technology.

Timeline

The demonstration plant development is anticipated to be carried out in 3 years. Detailed activities are as follows:

First year:

- Do coordination with all stakeholders (Municipality, Ministry of Public Work, Ministry of Environment, local community, foreign body, etc.).
- Prepare project planning.
- Determine financial sharing
- Establish demonstration plant organization.
- Determine project locations and do socialization to the surrounding communities.

- Prepare basic design and feasibility study.
- Prepare detailed engineering design (DED).

Second year:
- Order imported machineries and equipment.
- Prepare site and land for the establishment of project.
- Construct buildings.
- Install machineries and equipment.
- Have operators training.
- Do the running test

Third year:
- Continue more detail of running test.
- Conduct evaluation of test results.
- Improve the system according to the evaluation.
- Do operation
- Do evaluation

Geographic locations for the implementation

Determination of the geographic location of chosen MSW treatment technologies is based upon the criteria where sites in the selected municipality are located and the local government has high commitment to operate the project. Besides, the municipality should have a plan of MSW recycling program in the medium and long-term periods. These cities can be a medium, big, or metropolitan types that are facing solid waste management problems. After considering those criteria, the proposed cities are selected that might include:

1) Bogor (West Java)
2) Yogyakarta (Center-south Java)
3) Surabaya (East Java)
4) Palembang (South Sumatera)
5) Makassar (South Sulawesi)
6) Balikpapan (East Kalimantan)

Resources Needed

Resources needed include:
- Professional institution or a private company that manages the demonstration plant can work with existing waste management;
- Qualified expert who can transfer the technology and operating demonstration plant;
- Professional workers who have got training, had high discipline and owned good commitment;
- Managers who fully support the existing waste supply and transporting residual waste to landfill continuously;
- Local and central government that fully support the construction and operation of demonstration plant;
- Sharing of adequate funding from both the donors and local governments;
- High community participation in waste sorting at source;

- Local workshops that support the provision of mechanical machinery (belt conveyor, magnetic separator, shredder, mobile rotary screen, in-vessel composter, etc.);
- Facilities and infrastructure for waste collection and transportation programs that support waste segregation at source; and
- Laws to support the operation of demonstration plant.

Regulatory Change

The umbrella laws of demonstration plant are:

- Act No. 32 of 2009 on Environmental Protection.
- Act No.18 of 2008 on the Management of Municipal Solid Waste.
- Act No.7 of 2004 regarding Water Resources.
- Act No.32 of 2004 regarding Regional Government.
- Ministry of Home affairs Regulation (Permendagri) No. 33 of 2010 concerning Municipal Solid Waste Management.
- Local regulations relating to waste management.
- Mayoral Decree related to waste management.

Coordinating or Implementing Institution

Implementing or coordinating institution is the Ministry of Public Works, while supporting Institutions include the Ministry of Environment, Ministry of Home Affairs, BPPT, DNPI and the local governments.

2.3.6. Project ideas for international support

Type of Technology

MBT is heavy mechanized waste treatment facility. Actually, some equipment of the MBT can be possibly made in Indonesia, but some of complicated equipments have to be imported. This situation needs international support in technology transfer and IPR negotiation.

Capacity Building Aspect

In order for the application of MBT to be sustainable in its operations, the ability of local engineers and the operators must be improved. Therefore, the international support for this technology transfer is directed to help in improving the capacity building of Indonesian researchers and users by foreign experts. This can be done through training, tutoring and knowledge transferring during practical work at the plant. If there is a technology innovation arising during MBT operation it should be set in the agreement, especially relate to Intellectual Property Rights (IPR).

Financial Aspect

Grants and/or loans with low interest rate from foreign aid are needed. The use of this aid is such as for:

- Pre-Instalment cost: planning, FS and DED
- Capital cost: construction and machineries installation.
- Operation and maintenance cost: salaries, utility bills, tools and supplies, fuels of machines. Etc.