

# Review Paper on Solar Trash Powered Compactor bin

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**Abstract :** Municipal waste management techniques can vary widely between countries and between regions within countries. Europe and several other places around the world favor Evacuation underground system of vacuum pipes to transport waste to landfills or incinerators Responsibility for waste management generally falls under the jurisdiction of local, state and territory governments. Trash compaction is a process of compacting waste. The various process of trash decomposition produces air pollution and water pollution. Nowadays trash is placed in one place greater level for decomposition. In India many garbage dust or waste left by creating pollution problem as well as environment problem. The objective of this project is to compact the trash without producing any pollution. With the help of microcontroller and compaction mechanism the size of trash is reduced so that in the so that in small space more trash can be stored. Again this compacted trash can be compact again and the space used to store the trash can be made free. It will also reduce the diseases wise main cause is trash.

**Keywords:** compaction, garbage dust, trash, decomposition pollution.

## INTRODUCTION

The problem of trash control and disposal reveals itself in many facets of our society, from carnivals and city fairs in the summer time to overflowing garbage cans in a fast food restaurant. People often attempt to cram their waste into a trash receptacle already struggling to balance the trash piled on top of it. To solve this problem, we propose an automatic trash compactor that manages the trash levels and notifies when the receptacle needs to be emptied all by itself. Utilizing a trash compactor instead of a normal trash can increases the amount of trash that can fit inside the same sized receptacle. add further convenience, the compactor will sense when the container is full, and will automatically compact the trash as needed. When the trash cannot longer be compacted, it will lock itself and signal that it needs to be emptied.[1] Several considerations were taken into account when determining this design including compression ratio of compaction, force of compaction, ease of use, sanitary considerations, and aesthetics. Main technical considerations included providing a compaction pressure comparable to the 15 psi seen in automatic trash compactors, as well as a container robust enough to handle pressure forces due to compaction.[2]The method chosen as a means of compaction was a hydraulic system actuated by pressing down on a foot pedal. The objective of this project is to compact the trash without producing any pollution. With the help of microcontroller and compaction mechanism the size of trash is reduced so that in the so that in small space more trash can be stored. Again this compacted trash can be compact again and the space used to store the trash can be made free. It will also reduce the diseases wise main cause is trash.[3].

## PRESENT SCENARIO

Ordinary municipal trash barrels often overflow. The Waste Management Solar-Powered Trash Compactor [10] holds five times as much refuse – and signals when it's ready for pick-up. Municipalities can opt for a convenient leasing program that provides an alternative to purchase. Leasing lets customers achieve immediate savings instead of expending major cash resources. , the Waste Management Solar-Powered Trash Compactor works even in areas that don't receive direct sunlight. Review on Solar Trash Compaction Prof. Mrs. Swati Shinde, Harita Bhosle, Asha Borkar, Amit Kadve, Sneha Pichad Review on Solar Trash Compaction 138 www.erppublication.org In July 2009, the city of Philadelphia will deploy 500 Solar-Powered Trash Compactors [4] within the downtown district known as Center City. With the new compactors, the city expects to reduce weekly collections from 17 to only five to seven. Over the course of ten years, these reductions are projected to yield cash savings of more than \$12 million and many more. Recently, the city of Philadelphia [4] replaced 700 regular trash receptacles with 500 solar powered trash compactors and 210 single stream recycling units. Now, rather than making 17 trips each week to empty 700 receptacles (annual cost ~\$2.3 million), the city now collects only five times per week at an annual operating cost of approximately \$720,000-a 70% savings. Performing 17 collections each week required 33 workers on three shifts, five collections per week under the new program require only nine workers on a single shift. The other workers have been reassigned to other, more productive tasks. This continuous increase in generation of solid waste become havoc due to poor management practices in India. It is very important basic services provided by the Government of India and for its management, usually municipalities and other local bodies are responsible under the Municipal Solid Waste Management and

Handling Rules -2000. But municipalities and local bodies generally fail to attain this responsibility[5]. The poor practice is mainly due to lack of appropriate collection, transportation and disposal system, lack of technical expertise and insufficient financial resources [6]. Due to poor practice, MSW is disposed off in low lying areas or open dumps in the outskirts of towns/cities without necessary precautions. This kind of unscientific practice of solid waste leads to environment unsustainability by air, soil and water pollution Rapid urbanization and population growth contributes enhanced municipal solid waste generation. Generation and characteristics of MSW may vary at the level of country, state, city as well as within different areas of the same city. According to report of Indian energy portal (Fig. 1), the municipal solid waste in India has an uninterrupted increasing trend from 1971-25. The per capita waste and total urban municipal waste increased from 375 g/day and 14.9 MT/yr. In 1971 to 490g/day and 48.5 MT/yr. In 1997 respectively. It is assumed that the generation of per capita waste increased and total urban municipal waste will increase to 700 g/day and 97 MT/yr. By 2025 respectively, which is approximately double of the amount of solid waste in 1997.[8]

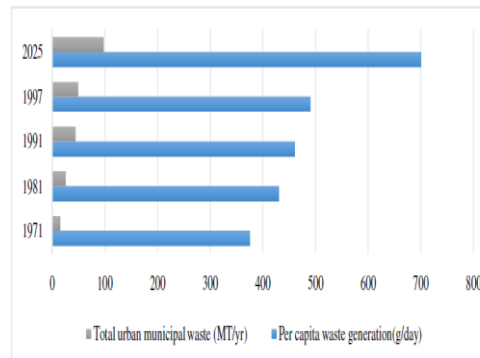


Fig.1 Waste Generation Trends in India.

Solar compactors have been installed in the Third Avenue corridor in downtown Seattle as well as in the City of Kirkland, at the University of Washington and on Bainbridge Island. The increase in the number of solar compactors installed in the region indicates that there is demand for solar compactors in the area and that the machines are suitable for the Seattle climate despite the cloud cover. The University of Washington Recycling and Solid Waste Manager noted, We expect the increased capacity and the as-needed servicing to dramatically reduce our fuel use and disposal costs while using a sustainable energy source to create these efficiencies. It's a win for our planet and a win for our university. Solar compactor is shown below used for waste management.[9]



Fig.2 Solar trash compactor

The solar-powered compaction garbage bins are designed to reduce the need to empty waste receptacles in public areas. The bin holds more than six times the volume of the average 120 L mobile garbage bin, leading to the elimination of at least three out of every four collection trips. This not only reduces operating costs, unsightly litter overflows and public disturbance, but also minimizes emissions from waste-carrying vehicles, further benefiting the environment. The solar-powered compaction garbage bins are equipped with a solar photovoltaic panel and a small battery.[10] The battery is charged during the day allowing the unit to operate during night time. The bins automatically compact the waste when the garbage inside reaches a certain level. As users deposit garbage, it falls into a bin inside the unit. When the level of garbage eventually rises above the top of the inner bin, the garbage interrupts an electric eye beam, triggering the motor to compact the garbage down into the bin, making room for additional garbage. The process repeats automatically as needed until the machine is ready for collection, typically holding about 700 L of equivalent uncompacted garbage. At

that point, a LED light indicator on the front panel goes from green to yellow, notifying staff that the unit is ready for collection. The bins can be color-coded and used for either non-recycling or recycling waste materials. Internal structure of solar powered compactor is shown below. [10]

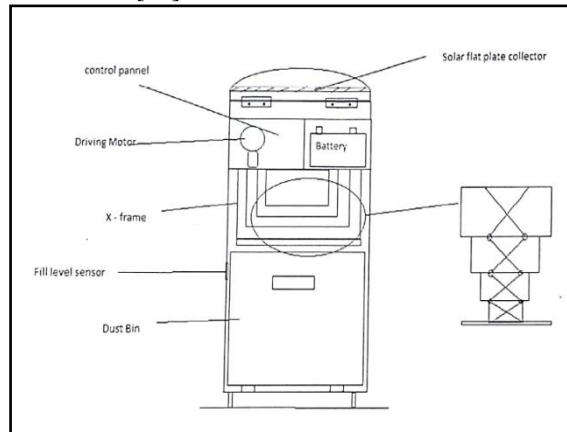


Fig.3 Internal structure of solar powered compactor bin.

There are different types of solar powered compactor bins are manufactured following compactor bin is attached with PLC system as shown below.

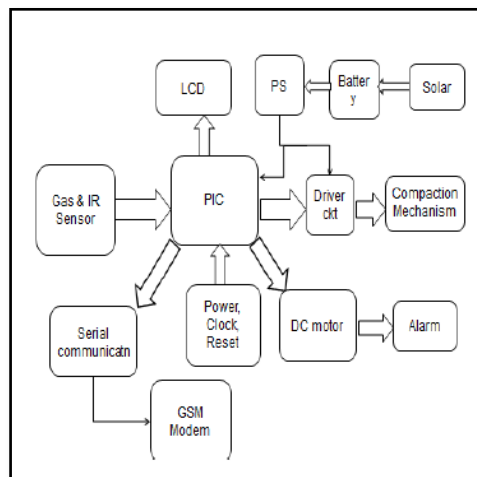


Fig.4 Block diagram for trash compactor

**1. HARWARE COMPONENTS:**

Power supply, microcontroller PIC, IR sensor, Gas sensor, Dc motor Buzzer, LCD display and Solar.

**2. SOFTWARE COMPONENTS**

PIC Simulator Tool.

**3. Performance Requirement**

- Have the ability to detect un-compacted full and compacted full (i.e. be completely autonomous)
- Have the ability to compact paper, plastic, and light metals (e.g. aluminum cans)
- Have a functional LCD screen to display the receptacle's current status
- Transmit a full signal up to 1000 ft.

**BENEFITS OF THIS PROJECT**

**1. Saving Time and Money**

Instead of stopping at 100 trash cans every day, our workers only have to stop at 3 or 4. Everything from gas to man power turns into savings.

**2. A Cleaner Environment**

It has a ton of benefits— it will save the city time and money keeps litter from overflowing, and discourages illegal dumping of trash. This will save us a lot of time for guy to fill potholes, fix sidewalks and do other things.

3. Reduces unwanted overflow of trash.
4. Reduces the number of times a trash can need to be emptied.

### CONCLUSIONS

The goal of this project is to make a solar trash basket. As it is intended for commercial use, the price is an important factor. To account for that, each component that is not expensive as well as efficient is used. Also, since the trash basket is used batteries for power, the batteries also need to be safe, efficient, and have a long lifetime. Using a standby time when the trash basket is not in use, batteries last longer than just keep on it all day.

Second, to improve the understanding of technology, its appropriate application, potential consequences should be considered. This project utilizes several complex parts, which will require rigorous testing to successfully implement. The design combines electrical and mechanical parts to accomplish a task that could not be done as easily by only using one or the other.

Third, to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others, we fulfill this paper deals with the steps involved in trash compaction systems and an attempt to speed up the process.

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