

**UNIVERSITI TEKNOLOGI MARA**

**DESIGN AND FABRICATION OF  
DRAINWATER ENERGY  
CONVERTER**

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## **ABSTRACT**

This study focuses on designing a mini hydroelectric system for harnessing the energy of rainwater flowing through drainpipes in Southeast Asia, where frequent rains are common. The problem addressed is the significant waste of potential energy in residential, commercial, and urban water drainage. The project's main objectives are to design and fabricate a drain pipe energy converter using SolidWorks 2021. Methodologies include technical drawing in SolidWorks and fabrication using available machinery at UITM Pasir Gudang, with materials chosen based on market availability. The expected outcome is a portable, efficient system that generates electricity from drain water, promoting energy sustainability.

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# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of Study

In the southeast Asia, there are no other seasons like winter, fall, summer or spring. But there is a season where it would rain frequently which is normally in June or October. The average precipitation in depth (mm per year) in southeast Asia[1] could reach to around 2800mm especially in Malaysia in which the average precipitation in depth per year is measured at 2875mm.[2]

In such a rainy weather, the rain water is wasted just by letting it flow in the drain pipe to the sewer. As we can see, there are a lot of energy in the water running inside the pipe that haven't been used. From what I see, there are no steps taken in using the unused energy even with the drains on the side of the roads.

Hydroelectric is a system that harnesses the power of water in motion such as water flowing in waterfalls to generate electricity.[3] This process typically involves building dams on rivers or streams to create reservoirs of water at a higher elevation. When this stored water is released, it flows through turbines, which are connected to generators, converting the kinetic energy of the moving water into electricity.[4] People have used this system for millennia but there are still no smaller sizes that can be use for outdoor uses.

Hence, there is a need to design and create one that can be a personal use to put inside a drainpipe or anywhere outdoor. The aim of this project is to create a mini hydroelectric system inside a drainpipe and outdoor uses by using any flowing water sources as a power supply.