



**SILESIA UNIVERSITY OF TECHNOLOGY  
FACULTY OF ELECTRICAL ENGINEERING**

**Department of Power Electronics, Electrical Drives and Robotics**

# **Engineering thesis**

## **Design and construction of the photovoltaic module tester**

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### 1 WHAT IS ENERGY HARVESTING?

Energy Harvesting is a process of using ambient energy by converting it into a usable form, i.e. electricity or heat. It is important to point out that energy harvesting has been around for quite a long time, since solar panels, wind turbines and water turbines are in constant use for a few decades, providing people with environmentally clean energy [1].

There are some important issues related to any energy source that could be potentially used for harvesting. First of all, it is crucial to evaluate intensity and availability of that source. Subsequently, one should find out a cost-effectiveness of the solution as well as the influence of the harvesting process on the primary energy source [1].

Type	Conditions	Power Density	Area or Volume	Energy/Day
Vibration	$1m/s^2$	$100\mu W/cm^3$	$1cm^2$	8.64J (assuming continuous vibration)
Solar	Outdoors	$7500\mu W/cm^2$	$1cm^2$	•
Solar	Indoors	$100\mu W/cm^2$	$1cm^2$	•
Thermal	$\Delta T = 5^\circ C$	$60\mu W/cm^2$	$1cm^2$	•

### 2 OPERATIONAL AMPLIFIER SELECTION

Random citation [1] embeddeed in text.

### ***REFERENCES***

- [1] N. W. Stephen Beeby, *Energy Harvesting for Autonomous Systems*. Artech House, 2010. ISBN: 978-1-59693-718-5.