

Innowattech has developed a new alternative energy system that harvests mechanical energy imparted to roadways, railways and runways from passing vehicles and trains and converts it into green electricity. In addition, Innowattech has developed a unique generator, which produces electricity from pedestrian movement (walking, running, dancing, etc.) The system based on a new breed of piezoelectric generators harvests energy that ordinary goes to waste and can be installed without changing the habitat.

Innowattech is a privately held company specializing in the development of custom piezoelectric generators. The Company is based in Ra'anana Israel with research facilities in the Technion, Israel Institute of Technology, Haifa, Israel. Innowattech's IP is protected as patent pending.

The Innowattech Green Energy Solution:

The piezoelectric phenomenon was first described by the Curie brothers, who observed that certain materials generate electric current when they are deformed. Today piezoelectric materials have multiple uses in industry both as sensors and actuators. Innowattech has developed a new breed of piezoelectric generators with a mechanical/electrical association ideally suited to harvest the mechanical energy imparted to roadways from passing vehicles, trains and pedestrians. The system does not harm the efficiency of the vehicles, trains or human movement. In addition Innowattech has developed a very efficient storage system to collect and store the electricity produced by these generators. The accumulated energy can be used for local power needs or routed into the grid.

Innowattech's solution is optimal. It maximizes retrieval of wasted mechanical energy converting it into electrical energy. It then stores the energy with minimal energy waste. The energy is also produced in close proximity to its end users. It does not require the use and development of vast new areas as do solar and wind farms.

Innowattech's solution for the roads, railroads and runways is capable of producing significant amounts of electricity and has an economical and commercial advantage over other green alternatives. The building costs and the expected return on investment time are estimated to be much lower than for solar energy. The solution is applicable to any place with heavy vehicle travel and not confined to specific climate and geographic areas as are solar and wind energy.

Innowattech's advantages:

- Economically competitive to traditional carbon-based energy production.
- The movement energy of busy roads, railroads and runways all day long near population centers can be converted into electrical energy that can be supplied to nearby customers.
- The electrical storage system which is integrated in the roads, railroads and runways does not take up any public space and functions in all weather conditions.
- Innowattech's electrical storage system does not require any additional maintenance after its implementation.
- Innowattech's solution can serve as information gatherers in future "Smart Roads" and "Smart Airport."

Innowattech road harvesting system applications:

- Power plant, feeding electricity to the grid.
- Lighting street lights, traffic lights and warning signs.
- Powering road side electric devices such as billboards without the need of existing power line infrastructure.
- Deliver real-time data on the weight, frequency and speed of passing vehicles as well as the spacing between vehicles.

Technology Comparison:

	Wind	Solar	Geothermal	Hydro power	Coal	Oil & Gas	Piezoelectric harvesting from roads, railways & runways <small>INNOWATTECH ENERGY HARVESTING SYSTEMS</small>
Payback, years**	12 – 30	20 – 30	10 – 20	12 – 15	15 – 20	10 – 13***	4 – 8*
Reliable	✗	✗	✓	✓	✓	✓	✓
Clean	✓	✓	✓	✓	✗	✗	✓
Mature Technology	✓	✓	✓	✓	✓	✓	✗
Deployment Availability	✗	✗	✗	✗	✓	✓	✓
Implementation in urban areas	✗	✓	✗	✗	✗	✗	✓
Low maintenance cost	✗	✗	✗	✗	✗	✗	✓
Successfully operates in Northern areas	✗	✗	✓	✓	✓	✓	✓
Preserves environment in original state	✗	✗	✗	✗	✗	✗	✓

*Depending on the volume of traffic

**Assuming revenue from consumer of 10¢ per kWh

***Assuming revenue from consumer of \$60 per barrel

- Innowattech harvests energy that ordinary goes to waste WITHOUT changing the car's MPG or ANY road characteristics.
- Innowattech's vehicular system can produce 400 kWh from a 1 km stretch of dual carriageway.
- This is enough energy to power 500 homes!