

Renewable Energy & Electric Vehicles

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Energy map of Macedonia



Source: ELEM

Balance of electrical energy - 2011

➤ The gross national electricity consumption in the Republic of Macedonia, was **9 552 855 MWh**, the share of domestic production was **72%**, while **imports accounted for 28%**.

➤ The biggest consumers of electricity in 2011 were the households with a share of **35.0%**, the industrial sections (energy section plus industry) with **28.3%**, and the other sections with **17.2%** of the gross national electricity consumption.

Renewable energy is energy that comes from resources which are continually replenished such as: sunlight, wind, rain, tides, waves and geothermal heat.

Renewable energy production in 2011 - Macedonia -

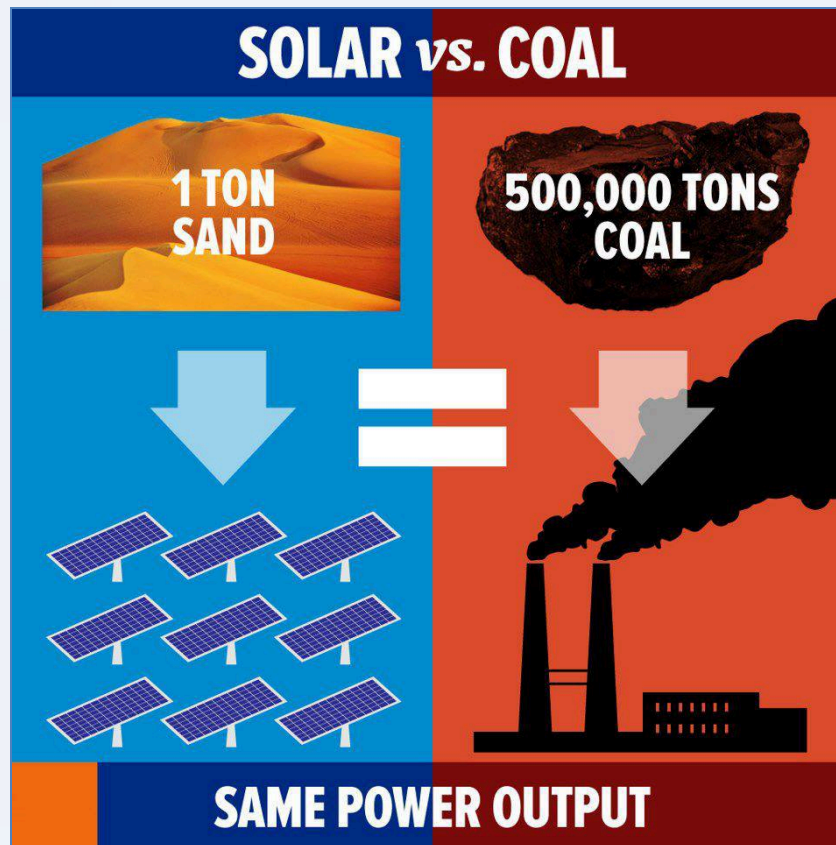
The production of Renewable Energy in the Republic of Macedonia consisted of:

- Wood (wood fuel, wood waste, other solid waste) 714 557 m³
- Geothermal Heat 3 565 350 m³
- Biodiesel 4 513 tones
- Hydroelectricity 1 433 120 MWh
- **Solar Energy 1 173 MWh**

Solar energy

- Total electricity consumption (9 552 855 MWh)
- Solar energy production (1 173 MWh)
- Solar energy < 0.01 %
- 18 (10+8) MW Photovoltaic power plants
- Feed in tariff 16/12 €cents/kWh

Energy from the Sun, that comes to the Earth in few minutes is equal enough to satisfy the energy demand of the world in whole year!



Wind energy

- Wind park 50MW in Bogdanci (ELEM project)
 - first phase with 36.8 MW and an annual net production of 100 GWh
 - second phase with the remaining 13.8 MW and an additional net production of 37GWh.
- wind energy - approx. 2 % of its (ELEM) current annual electricity generation.
- 65 MW until 2017 up to 150 MW till 2026.
- Feed-in tariff 8,9 €cents/kWh.
- Excellent potential in Vardar valley for small wind generators.
(from Demir Kapija to Greek border near highway)

How we can use Renewable energy to make
Electric Vehicles more “greener” ?

Renewable energy for EV

1. Small photovoltaic systems for home users.
2. Photovoltaic systems for commercial use.
3. Built-in PV cells/systems in EV.
4. Small wind turbines (WT) for home and commercial use.

1. Small photovoltaic systems for home users

✓ 5.6 kW photovoltaic solar system on the roof of residential garage. Monthly, the system generated 650 kWh worth of electricity, equivalent to 4184 km (155 wh/km) of driving in a plug-in electric car.



2. Photovoltaic systems for commercial use



❖ Parking lots

❖ City malls



3. Built-in PV cells/systems in EV

- ❖ On the roof/front of the vehicles or mobile PV generator



4. Small wind turbines (WT) for home and commercial use

❖ Wind turbine chargers



**”I'd put my money on the sun and solar energy. What a source of power! I hope we don't have to wait until oil and coal run out before we tackle that.” – Thomas A. Edison
In conversation with **Henry Ford** and **Harvey Firestone** (1931)**

Thank you for your attention!

