

# **Involvement of photovoltaic panels and heat pumps for family houses and their subsequent regulations to obtain maximum energy self-sufficiency**

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## **Abstract**

It has been nearly 15 years since the first installation of photovoltaic panels in the Czech Republic. During that time many things have changed, but the photovoltaic panels are still on our market and in greater numbers, and not only thanks to state subsidies for renewables.

Increasingly, it is possible to see photovoltaic panels in small numbers on houses where private users try to get at least a little from renewable sources as solar energy for their own benefit or for the added form of financial support for electricity sold subsequently.

Not only because the focus is on systems for small users, such as family homes and small businesses with ordinary consumption up to 10kWh, which solves the issue of economic indicators of such systems. Solution ecology is not available and in most cases is a secondary objective. The main goal for these smaller users thus remains a quick return and subsequent gain in terms of maximum possible energy self-sufficiency. To achieve optimum results in addition to the implementation of appropriate elements, reduction of consumption, use of modern energy-saving appliances, efficient use of energy, the possibility of regulation, thanks to the data and predictions. The best optimal wiring for houses at acceptable cost with a return of about 12 to 15 years and the use of photovoltaic panels, battery storages and heat pumps, today reached during the lifetime value of more than 70% self-sufficiency. For larger investments, according to the results we can achieve complete energy independence much earlier, but economic indicators are for ordinary users, in most cases, unacceptable. Our goal is for all implementations with the use of our control, with the help of the company Ekoenergie, achieving levels of about 80% energy self-sufficiency, and has been since the first day of commissioning of the system. These complete systems for regular users and owners of family homes, the planned reduction in the total return on the value of a maximum of 8 years.

## **Keywords**

Renewable sources of energy, regulation, photovoltaic panels, energy self-sufficiency