



**“Gheorghe Asachi” Technical University of Iasi, Romania**



---

## **ANALYSIS OF INTEGRATION OF SOLAR COLLECTOR SYSTEMS INTO DISTRICT HEAT SUPPLY NETWORKS**

**Jolanta Dvarionienė\*, Jurga Šinkūnienė, Inga Gurauskienė, Giedrius Gecevičius,  
Žaneta Stasiškienė**

*Institute of Environmental Engineering of the Kaunas University of Technology,  
K. Donelaicio str. 20, Kaunas, LT-44239, Lithuania*

---

### **Abstract**

Supply of heat energy is of the high importance in the northern countries of the Europe. EU energy policy and high prices of the heat energy resources takes a challenge to find any alternative resources for generation of heat energy. Therefore in this paper the integration of renewable energy source - solar energy into the existent heat energy supply system is analyzed as the alternative or additional source of heat energy. The case study of the Girionys boiler-house (at Kaunas district, Lithuania) fired by the wood waste is presented, analyzing the efficiency of integration solar collectors in production of heat energy and determining both environmental and economic effects. Two alternatives have been analyzed for the installation of the solar collectors.

The research revealed that the solar collector system installed only on the boiler-house roof would pay back in 7-8 years by cutting thermal energy price by 1.7% and reducing boiler-house and its servicing transport emissions into the air – by 5.2%. Installing solar collectors on the tenement house, the innovation would pay back in 6-7 years, while the heating price would decrease by 1.4%, and the emissions into the air – would decrease by 5.2%. The current study shows the potential to increase the area of the photovoltaic panels, increasing the environmental and economic benefit as well.

*Key words:* cleaner production, district heat supply, renewable energy sources, solar energy, thermal energy

*Received: April, 2013; Revised final: September, 2013; Accepted: October, 2013*

---

---

\* Author to whom all correspondence should be addressed: e-mail: [jolanta.dvarioniene@ktu.lt](mailto:jolanta.dvarioniene@ktu.lt); Phone: +370 37300767; Fax: +370 37209372