FINANCING THE ENVIRONMENTAL PROTECTION IN UKRAINE

M.M. Gnidenko, postgraduate student.

Are the sources of finance for environmental protection efficient from a public finance perspective? What actions can be taken to increase the efficiency with which such funds are mobilized?

Ukraine's principal sources of public environmental expenditure are state and local budgets and special earmarked environmental funds linked to revenue from pollution charges.

The income of the funds comes primarily from pollution charges, which are imposed on enterprise emissions to air, water and waste in accordance with rates determined by national level legislation. The highest revenues collected have been for air pollution while the largest expenditures have been on mitigating water pollution. Data disaggregated by region show that compliance rates with charges and fines are lower in the regions where pollution is higher; and in these same regions, fines are less likely to be imposed on firms. In the case of some regions, this may be an indication that where charges become too high, firms have more problems paying. Most likely, however, lack of payment is a result of corruption in the system, or at least willingness to treat large polluting firms more generously on broad economic grounds.

Largely, pollution charges in Ukraine are not to reduce pollution; given their low levels, the pollution charges are unlikely to provide incentives to enterprises to invest in environmental improvement to avoid the charges. Rather, the charges are to raise revenue for environmental protection.

The following recommendations are made with respect to the financing of environmental protection:

* refine the institutional and legal structure for environmental funds;

* reduce the number of funds;

* introduce more rigorous guidelines for use of environmental funds;

* phase out environmental funds in the long run;

* earmarking funds for environmental protection may be a way to improve the quality and efficiency of the present system of financing.

HYPERBOLIC HEAT CONDUCTION IN THE LAYER WITH A TIME–DEPENDENT LASER HEAT SOURCE

T.A. Kirichok, postgraduate student.

Numerous applications (surface annealing, welding, drilling of metals, sintering of ceramics) connect with intensive heat generation on the processing material. For the purpose of studying of heat transfer in such processes an increasing interest has arisen recently in the use of nonclassical heat conduction models applying in essentially transient effects.

Classical Fourier low is based on the hypothesis that heat flux is in direct proportion to the temperature gradient and assumes infinite speed of heat transport. On bases of extended irreversible thermodynamics more difficult law was derived

$$\vec{q} + \tau^* \frac{\partial \vec{q}}{\partial t} = -a\, grad\, T\,.$$

(1)

The constitution law of Cattaneo-Vernotte (1) assumes that the heat flux vector (the effect) and the temperature gradient (the cause) across a material volume occur at different instant of time and the time delay between the heat flux and the temperature gradient is the relaxation time τ^*. When (1) is combined with the energy equation, we obtain the hyperbolic equation

$$a\Delta T - c\rho\left(\frac{\partial T}{\partial t} + \tau^* \frac{\partial^2 T}{\partial t^2}\right) = -\left(f + \tau^* \frac{\partial f}{\partial t}\right).$$

(2)