UDC 004.896

FORECASTS AND ASSESS THE FEASIBILITY OF VARIOUS TYPES ENERGY SOURCES IN GREENHOUSES

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The dynamics of changes in the cost of alternative energy sources; estimated relevance of predictive models of natural gas; The application of neural networks to create predyktiv price of natural gas; selected multilayer perceptron as a tool for making predictions about the price of natural gas; estimated cost structure of production of tomatoes; analyzed the degree of promising alternative energy sources in greenhouses.

Neural network, multilayer perceptron, forecasting, alternative energy sources.

Plan your energy costs for large enterprises provides an opportunity to assess his future income and the possible development in general. Obviously, the last time for greenhouses most important energy source was natural gas. Because the price is constantly changing, the question of adequate prediction [1].

The purpose of research - An analysis of forecasting the cost of all energy on the feasibility of their use in the production in greenhouses.

This prediction of natural gas for Ukraine to make very difficult because it often influence geopolitical factors. To predict the cost of gas, as time series zastosuvavsya mathematical tools neural networks (NN).

Synthesis and study of relevant NM performed in the software package Statistica Neural Networks. Implemented functional block optimization neuromodels architecture that uses linear approaches and simulation method "annealing" with Gibbs probability distribution:

$$P(\overline{x^*} \to \overline{x_{i+1}} \mid \overline{x_i}) = \begin{cases} 1, F(\overline{x^*}) - F(\overline{x_i}) < 0 \\ \exp(-\dfrac{F(\overline{x^*}) - F(\overline{x_i})}{Q_i}), \; F(\overline{x^*}) - F(\overline{x_i}) \geq 0 \end{cases}$$

where Qi> 0 - items freely flowing zero sequence.

As training samples zastosuvavalys statistics on gas prices during 2002-2013 yy for Ukraine (Fig. 1).

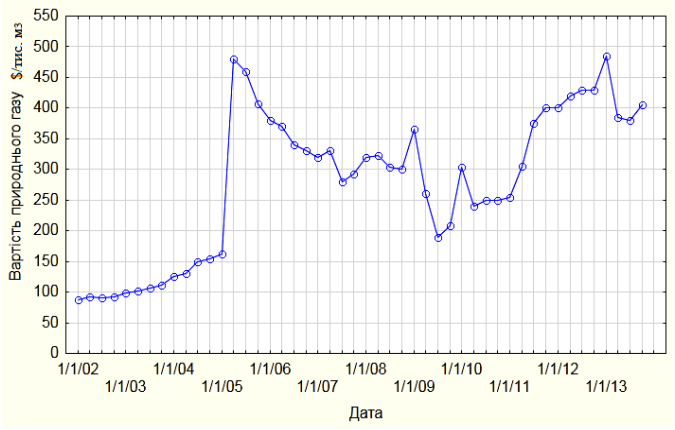

Fig. 1. Natural gas prices for Ukraine: 2002 - 2013 GG (quarterly)

Using neural networks allowed to synthesize the projected number of gas prices and create options for prediction without the last two quarters of 2013 (Figure 2).

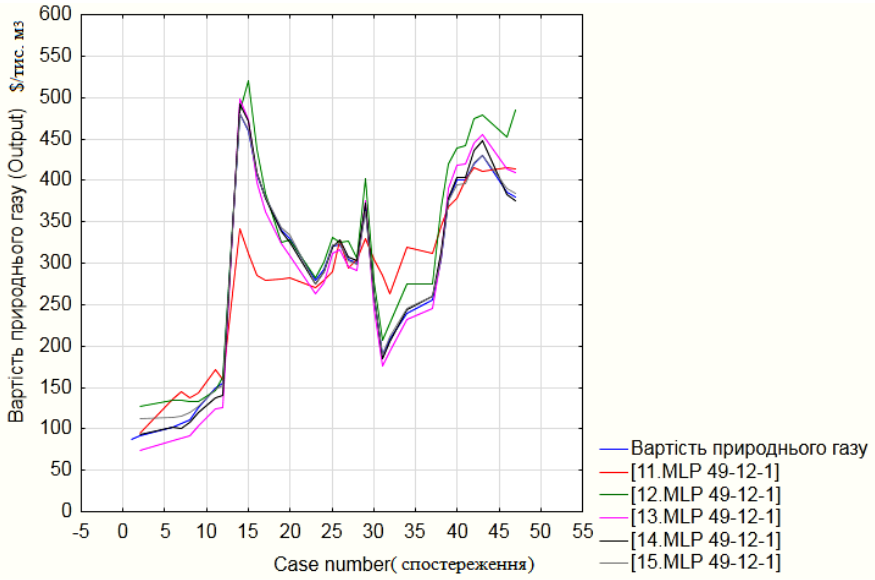

Fig. 2 Forecasting the price of natural gas (Ukraine)

Conclusions. The best quality educational Weather demonstrated multilayer perceptron: mean square error of - 0.9%. By submitting your entry to the cost of gas last two quarters of 2013, received quality forecast - 34.8%, indicating that the impact of unpredictable in terms of time series of factors.

List of sources

1. Awerbuch S., Morthorst P.-E. The Economics of Wind Energy. A report by the European Wind Energy Association. March 2009
2. Digest of UK energy statistics'. Renewable sources of energy. Department of Energy & Climate Change, 2012
3. World energy outlook 2012. International Energy Agency, 2012
4. http://renewableenergy.com
5. Гареев А.Ф. Применение вероятностной нейронной сети для задачи классификации текстов / А.Ф. Гареев // Наука и образование. – М.: НиО. – 2004. – №11. – С. 105-117.
6. Круглов В.В. Искусственные нейронные сети. Теория и практика / В.В. Круглов. – М.: Горячая линия – Телеком, 2002. – 382 с.