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# Sources and Streams

A successful solution of any problem including the most complex and unusual one is directly proportional to deeper and more profound study and comprehension of factors and causes that determine operation of the object under study. This truth requires no further arguments. But it is worth repeating when EKO addresses questions of maintaining stable and effective operation of heat supply systems in Russian cities. The present issue of the journal reviews the problems of actual conditions of such systems through examples of Novosibirsk (the paper by S.A. Bukharov and A.P. Shibanov) although most of them are common for most towns and cities of our country. In order to better understand today's problems one must learn how these systems appeared and how they managed to achieve required goals and objectives.

Thus, in Novosibirsk, heat supply appeared … "in 1936 … from the Thermal Power Plant on the right bank with a heat turbine 'Womag' with capacity of 6000 kV and maximum steam volume of 47 ton/hour… the objects of heat supply are houses, public buildings and municipal services (public baths, laundries, etc.) … Later on, heat will be supplied by several urban TPPs… Novosibirsk TPPs might use as fuel… "1) peat deposits of Novosibirsk district; 2) produced coal and char gas; 3) raw coal and production waste of coal enrichment plants of Kuzbass"[1].

Beside the technical side of deploying the heat supply, quite significant was the system of social relations and interactions of parties that produced and implemented corresponding decisions.

Although the new institutional economy admits that it is necessary to take into consideration the past experience and decisions in the framework of path dependence[2], the author of this passage thinks that it is appropriate to deal with this issues in terms of Marxist-Leninist

[1] Socialist reconstruction of Novosibirsk / the sector of planning special reconstruction of cities within the Supreme Council of National Economy and the Novosibirsk city council. Edited by F.V. Popov, S.A. Menshenin, A.M. Borschevsky. M.: Soviet power publishers under the jurisdiction of the presidium of the Central executive committee. 1936. 167 p. [P. 42–44].

[2] Institutions and Economic Development. Growth and Governance in Less Developed and Post-Socialist Countries/Edited by Christopher Clague. Baltimore and London: The Johns Hopkins University Press. 1997. 390 p.

philosophy – namely, as basis and superstructure. This approach is broader, it addresses the problem area directly in order to resolve a seemingly technical engineering task, which is modernizing (renovation) of heat supply in a post-Soviet city.

In the years of Soviet power, centralized planning and management with its inherent resource oversupply (also aimed at successful achievement of mobilization targets) created the system of heat and electricity supply driven to 'deliver' energy in a most economic way. This way of 'the economy of scale' consisted in combining most powerful sources and their complexation (cogeneration – simultaneous generation of heating and electricity). At the stage of generation both economy and economics were fine, which cannot be said about the consumption stage that used to (and still does) abound in network losses and low level of final useful consumption of received energy.

The pros and cons of such a system were balanced out by the economic system's capacity of centralized resource redistribution. This being said, priority as a rule was given to new objects, whereas those introduced earlier were reconstructed and modernized with a major lag behind the normative lifetime of equipment and grid. However, necessary production facilities for repair and modernization purposes had been installed and they were fully operational (the comments of V. G. Tomilov).

While changing the superstructure and transiting to the economy based on principles of market coordination, the 'margin of strength' of the Soviet period allowed not only to 'improve' initial financial and economic indicators of earlier implemented operating projects but also gave substantial benefits to those who came first to take plots for high-rise development. Alas, this was a brief period. Over time, problems of worn out grids, loss of heat, lower efficiency became rampant (also because it became impossible to maintain the co-generation mode in its initial form), etc. Now there are new factors and circumstances related to changed motivation of consumers (heat costing and saving on it, setup of own non-system sources of generation) as well as new technical opportunities of remote monitoring and control over processes of generation and distribution. All of these drove the demand for heating down.

Today it is not possible to resolve the glaring problems in a manner traditional for new economic relations – by including all costs

(from renovation of the grid to modernization of heating sources) into the heating tariff for consumers – due to huge sums of required investments and low paying potential of most households.

That is why the principle route of modernizing heat supply systems of post-soviet cities may be a combination of selective and incremental approaches. Thus, in districts of new housing development local heating grids may be installed on generally accepted principles and approaches of new economic relations (the interview of V. V. Golovkin). This requires careful, stage by stage sequential implementation of steps connected to modernization and renovation of previously laid 'foundation', which is impossible to do without a system of corresponding rules of interaction for all participants (the paper by A. S. Grigoriev and A. V. Kolmakov).

Renewal and reconfiguration of the grid as well as changing the type and makeup of generation sources (including the use of modern unmanned technologies) will eventually transform the basis of heat supply system. Its distinguishing feature will probably be a high degree of decentralization of all processes of generation and distribution of energy. Naturally, it is necessary to replace the 'superstructure' as well, which constitutes not only sales procedures but collective participation of all interested parties in effective and mutually acceptable solution of all arising technical and financial economic issues. Businesses (small and big players), authorities and consumers need to have a say in resolving similar questions. As for the authorities (especially municipal one), their real participation may not be possible unless they have more power in the tax and budget sphere. In current circumstances, it is the acute lack of financial resources that prevents the authorities 'to be open for dialodue' (the paper by S. V. Bukharov and A. P. Shibanov).

People created and applied efficient technical solutions for separate problems and issues of operation and development of heat supply systems. At the same time, with a 'multitude of technical systems, economic agents and their multidirectional interests' it is extremely challenging to find their acceptable mix (see the paper by P. A. Shchinnikov). One may only reach a result following the process of interaction of all interested parties – consumers, authorities and business. Creating participation procedures may turn

out to be the most difficult problem yet. But it is efficient interaction that is the first and foremost foundation for stable streams of heating in big cities and small towns of Russia.

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