DEVELOPMENT OF ENERGY SYSTEM MODEL OF THE CASPIAN REGION

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Introduction. The main objective of the project is to develop and to use the model of energy system of Central Asia and Caspian region (CAC): Azerbaijan (AZJ), Kazakhstan (KZK), Turkmenistan (TKM) and Uzbekistan (UZB) - TIMES-CAC-4R and to assess quantitatively the direct economic benefits of cooperation in export of hydrocarbons among CAC countries.

Materials and methods. TIMES is a technology rich, bottom-up model generator, which uses linear and mixed-integer programming to produce an optimized least-cost energy system. The model represents the whole chain of energy resources" flows starting from extraction to transformation, distribution and consumption, [1].

Scenarios. The following cooperation policies are directly modelled:

- exploitation of Caspian oil and natural gas resources;
- investment in the construction of new pipelines;
- maintenance of free exchange in the energy sector.

Results. In a stationary export case the total system extra-cost of non-cooperation is about 2.3 Billion USD'2000. The main losses are in Uzbekistan => extra-costs to about 0.5 Billion USD'2000 annually towards the end of the twenties. In case of increased export of oil and gas, the total revenues of CAC could increase by more than 22 Billion USD'2000. The cost of non-cooperation is more than 10 Billion USD'2000. In case with new directions of export, the exporting higher amounts directly to Europe could be more economically profitable than continuing with the existing routes. The extra revenues would be of 20 Billion USD'2000.

Conclusions. The efficiency of the CAC energy system could increase from the 2009 value of 51% to 67% in 2030 if optimal investments and development strategies will be implemented. This would bring the efficiency of the system close to the present average global level of 68%. The cooperation among Azerbaijan, Kazakhstan, Turkmenistan and Uzbekistan in the field of energy at large produces direct economic benefits to the region, [2].

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