

Accepted Manuscript

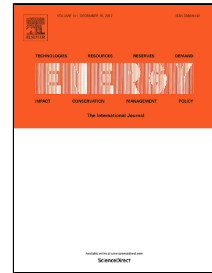
Analysis of the impact of technical and economic parameters on the specific cost of electricity production

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PII: S0360-5442(18)30014-8
DOI: 10.1016/j.energy.2018.01.014
Reference: EGY 12126
To appear in: *Energy*
Received Date: 31 October 2016
Revised Date: 11 December 2017
Accepted Date: 02 January 2018

Please cite this article as: Ryszard Bartnik, Anna Hnydiuk-Stefan, Zbigniew Buryn, Analysis of the impact of technical and economic parameters on the specific cost of electricity production, *Energy* (2018), doi: 10.1016/j.energy.2018.01.014

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14 **Analysis of the impact of technical and economic parameters on the specific** 15 **cost of electricity production**

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18 **Abstract.** This paper reports the results of analysis of technical and economic parameters on the specific cost of
19 electricity production. The use of a particular technology determines the value of the investment needed for the
20 construction of a power plant, its energy efficiency, internal electrical load of the power plant and its annual
21 operating time. Besides, this cost is considerably dependent on the interest rate on the capital, fuel prices and
22 environmental charges as well as, equally importantly, their variability in time. The variability in the prices of
23 energy carriers and their mutual relations are inevitable for a number of reasons. As shown in the paper the
24 change of the technical parameters in the range of the possible boundaries in a particular technology cannot
25 considerably reduce the specific cost of electricity production. The reduction of the current price relation
26 between gas and three-times cheaper coal (calculated per specific unit of energy) can considerably improve the
27 profitability of the use of the gas-steam technology. When the ratio of the cost of fuel in the specific cost of
28 electricity production is small, the impact of the fuel price on its value is also insignificant.
29

30 **Key words:** power plant; energy efficiency; electricity production cost; power technologies; exergy analysis;
31 technical and economic methodology.
32

33 **1. Introduction**

34
35 The value of the specific cost of electricity production depends on the technology in which it
36 is generated. The use of a particular technology determines the value of the investment needed
37 for the construction of a power plant, its energy efficiency, internal electrical load of the
38 power plant and its annual operating time. Besides, this cost is considerably dependent on the
39 interest rate on the capital, fuel prices and environmental charges as well as, equally
40 importantly, their variability in time. The variability in the prices of energy carriers and their
41 mutual relations are inevitable for a number of reasons. One of them is relative to inflation,
42 other ones are relative to economic fluctuations, including the detrimental effect of political
43 instability.

44 The technical and economic parameters discussed above determine the value of the specific
45 cost of electricity production to a various degree [1]. What is more, the range of the variability
46 of these parameters is limited in a given technology, except for such economic parameters as
47 fuel prices, fees and charges in environmental policy. Hence, it is necessary to perform an
48 analysis involving the find an answer to two questions, first of which regards the impact of the
49 above parameters on the value of the specific cost of electricity production, whereas the other
50 concerns the fact how the variability of these values in a given technology can lead to the
51 reduction of the specific cost of electricity production.

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