How should governments secure energy supply?

A cost-benefit approach

Mark G. Lijesen[1], Jeroen de Joode[2], Douwe Kingma[3] and Machiel Mulder[1],

The California electricity crisis in 2001 and the liberalisation of the European energy markets have fuelled doubts about the willingness of private firms to invest in the maintenance and expansion of production and transport capacity. Moreover, the growing dependence on oil and natural gas from politically unstable countries has increased worries about the security of the supply of those energy carriers. The recent blackouts in North America and various European countries emphasize the importance to society of a secure supply of energy. The key question in the political debate on security of supply is how and whether governments should intervene in energy markets in order to increase the security of supply. We present a cost-benefit analysis of several security of supply measures to help answer this question.

Disruptions of energy supply come at low frequencies and high costs. A fairly large number of possible crises may cause these disturbances, each of which has a small but unknown probability. The uncertainty obstructs the possibility of computing probabilistic outcomes. We design a framework, using 'if-then' outcomes. These outcomes are then used to compute 'break-even frequencies', the (decrease in a) expected frequency of a certain scenario at which net benefits are exactly zero.

We apply the framework to six policy options, equally divided between oil, natural gas and electricity markets. On the oil market, policies include investment in strategic oil stocks and encouraging the use of biomass in transport and chemicals. Policies on the natural gas market include extending the life-time of the Groningen gas field as a swing supplier and substitution towards other fuels in the power sector. Capacity market and electricity taxation are the measures considered for the electricity market.

Two types of conclusions follow from the study. First, we find that the proposed framework is a useful tool to analyze the costs and benefits of security of supply policy measures. The second type of conclusion relates to the viability of individual policies. The general impression from these conclusions is that governments should be reluctant to implement this type of policies.

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[1] CPB Netherlands Bureau for Economic Policy Analysis, sector competition and regulation.

[2] Energy research Centre of the Netherlands (ECN).

[3] CPB Netherlands Bureau for Economic Policy Analysis, sector International Economics.

Corresponding author:
Mark G. Lijesen
CPB Netherlands Bureau for Economic Policy Analysis
sector competition and regulation
P.O. Box 80510
2508 GM The Hague
The Netherlands
phone: +31 70 338 33 22
fax: +31 70 338 33 50
email: mgl@cpb.nl
website: www.cpb.nl/goto/mgl

Resume:
Mark Lijesen is an economist and works as a researcher at the CPB and was formerly at the Institute for Research on Public Expenditure in the Netherlands. Recent research includes projects on economic effects of energy taxation, competition and regulation in energy markets and security of supply policies