Predicting Crude Oil Production AndDemand By Using Grey Model(1,1)

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Abstract

The grey theory can be applied in the research of prediction, decision-making and control, especially in prediction. The   primary characteristic of a grey system is the incompleteness of information. A grey system could be whitened by way of inserting more messages in itself and its accurac of prediction could be raised. Grey Model (1, 1)(short for GM(1, 1)) was applied to forecast the future value of crude oil production and demand daily in per year in this paper. GM (1, 1) was established according to the time-series. Base on MATLAB software, the forecast value of crude oil production and demand was given. The objective in this study is two field. The first is to forecast the crude oil production and demand in world by use the grey model(1,1). The second is to compare the forecasting results of the GM(1,1).

Key words: grey model(1,1),crude oil production,crude oil demand,forecasting

1. Introduction

Grey theory which was pioneered by Professor Deng in 1982 is a new theory and especially appropriate for prediction[1]. The random variables are regarded as grey numbers and the stochastic process is referred to as a grey process for the grey theory. Deng considers most of the existing systems to be ''generalized energy system'', and emphasizes that non-negative smooth discrete functions can be transformed into a sequence having the approximate exponential law which is the so-called grey exponential law[2]. Accumulated Generating Operation, abbreviated as AGO, associated with Inverse Accumulated Generating Operation, abbreviated as IAGO, is the main method presented with grey system theory to have a manageable approach to treat the disorganized evidence. A grey system could

often be characterized by a (time) series. Only or over four entries of the original series can be used to build model for prediction by the existing grey prediction GM (1,1) model [3]. Grey system theory, propounded by Deng is a truly multidisciplinary theory dealing with grey systems that are characterized by both partially known and partially unknown information. It has been widely used