Research on the Game Theory and Logic Optimization and the Applications on Construction of China's New Energy Subsidy System

Yi Kuang

Abstract

In this paper, we conduct research on the game theory and the logic optimization and the applications on construction of China's new energy subsidy system. The management of energy and the general optimization of energy structure play an important role in the development of the national economy and the upgrading of industrial structure. Therefore, it is the inevitable choice to build a well-off society in an all-round way. The energy projects management in tradition adopts way from bottom to top, namely from the floor of project management starts to collect the data, progressive upward transmission to the high-level, after analysis carries on the management and control to the project, this method had guaranteed the project pays according to progress, quality, cost and other requests, in view of the management of single project. This paper integrates the game theory and the logic optimization to construct the revised system that will be meaningful.

Keywords: Game Theory, Logic Optimization, New Energy, Subsidy System, China.

Introduction

Presently, although the influence of financial crisis is slowing down gradually, the world economy is recovering slowly, while foundation is unreliable "all sorts of signs to indicate that the development of the world economy is in relaxes with the post-crisis time of unknown turbulently coexisting, the recovery of economy needs the new point of growth to support" the development of the new energy industry and low carbon economy that will involve many industry sectors, once technically makes the great breakthrough, the new energy industry may create the new round economic boom. Based on the literature review, the new energy policies around the world can be summarized as the follows.

- EU: Increases the development green energy the effort. EU while paying great attention to advance the new energy industry technological innovation and research and development, but also the social mechanism of structure system and market synergism, to promote and promote the continuous innovation of new energy technology and applies. First, the development of a series of legally binding common planning system while clearly defined the responsibility of various types of innovative bodies, in particular the responsibility for the transformation and application of results; the second is to promote the establishment of the market trading-based carbon emissions trading mechanism; through the tax and financial policies to support and guide the innovation

1Renmin University of China, District Beijing, 100872, P.R. China
and application of new energy technologies, the establishment of the use of the new energy technologies, tax relief policy, the proposed European Investment Bank EU structural funds to strengthen support for new energy technologies.

- The United States: Attaches great importance to the development of new energy. In 2010, the US Department of Energy launched a fiscal year budget of the 26 billion US dollars for the Department of Energy's Energy Efficiency and Renewable Energy Bureau of the US Treasury is more clearly defined, energy independence to reduce greenhouse gas emissions, the use of bio-energy plants and some other new Energy projects can enjoy the government's bio-energy subsidies to attract consumers to use more new energy, the US government introduced a series of subsidies and tax incentives such as consumers to buy a hybrid car will be tax breaks.

Although the new energy industry development obtained made the result of world attention, while the entire industrial development was much centralized in equipment manufacturer, the market use factor was low and the industrial digestion ability was not strong. Specifically speaking mainly has the following problem. (1) China's new energy industry is mainly concentrated in relevant manufacturing process, most of the exports, so the dependence on the foreign markets is very high, which is the most obvious in photovoltaic power generation industry. (2) In recent years, China's photovoltaic industry has experienced explosive growth is the world's largest solar cell producer, but in sharp contrast, in 2016 China's solar PV installed capacity of 55MW, only the world's total installed capacity of 0.95%. (3) Although China has become the world's second largest wind power installed capacity, the largest solar cell production, in the field of basic research and development was lagging behind, the key technical bottlenecks cannot have the big breakthrough. Therefore, the new energy subsidy system should be constructed. The figure one shows the trend.

![Figure 1. The Developmental Trend of the China's New Energy Subsidy.](image)

To deal with the mentioned challenges, in this paper, we conduct research on the game theory and logic optimization and the applications on construction of China's new energy subsidy system.

**The Proposed Methodology**

**The Logic Optimization.** The space and the time are based on the object relationship model to the relational model likely designs. Object-oriented data model power of expression, but is not easy to realize and the relational model semantics is simple, realizes easily, but is not suitable to
reach the complex object. Object relationship model can combine advantages of both, through
the user-defined abstract data types and operation of the expansion of the relational model that
can effectively use the object technology to represent some complex data.

The core idea of the spatiotemporal object relational model is to extend the spatiotemporal
objects of the relational model and realize the function of spatio-temporal data management by
extending the spatio-temporal objects and their operations. Based on the review, the
optimization function is listed.

\[ D = O_1 \cap O_2 \cap \cdots \cap O_k \cap L_1 \cap L_2 \cdots \cap L_M \]  

(1) Spatiotemporal extension of the object-relational database, including the expansion of the
spatio-temporal data types, the expansion of basic spatio-temporal operations and the expansion
of spatio-temporal indexes (spatio-temporal index expansion and the spatio-temporal indexing).
(2) Operation is similar to the expansion, but also through the UDR to achieve); (2) space-time
query optimization layer. The optimized structure has continued to use object-oriented
relational database the basic philosophy of implemental structure, because the realization route
of this structure is quite clear, realizes relatively easily, moreover bases on the expansion of
essence, helping the practical application of the spatio-temporal database. But because the floor
DBMS query optimization rule is unmodifiable, is unable to use the general extended
technology to expand, therefore increased a query optimization level to complete in the
optimized structure to the logic optimization of spatio-temporal query, the physical
optimization still the space and time element that expanded through the floor directed the
technology to realize, logic optimization that because in this new implemental structure, the
spatio-temporal query optimization level only responsibly inquired. In the following figure two,
we show the general architecture of the logic optimization.

Figure 2. The Demonstration of the Logic Optimization.

**The Fuel Subsidy System.** Along with the economic society rapid growth, the resource
bottleneck restriction issue increasingly is with steady steps conspicuous, how to optimize the
energy source structure and safeguard energy supply became the related to overall situation
significant strategic task, and various countries then develop the new energy.

The energy projects management in tradition adopts way from bottom to top, namely from
the floor of project management starts to collect the data, progressive upward transmission to
high-level, after analysis carries on the management and control to the project, this method had
guaranteed the project pays according to progress, quality, cost and other requests, in view of the
management of single project, its shortcoming lies in cannot discover and target of enterprise
promptly has the deviation or surmounts the enterprise controlling force the project, in our country many energy projects as a result of improper of administrative mode, the strategic requirement of goal as well as energy organization that serious deviation project initially sets. Therefore, the project portfolio management organization and strategic management activities of enterprises through the project portfolio management, can reasonable use of various resources of general enterprises, adapt to the changing market environment, improve the success rate of the projects, so as to enhance the competitive advantage of enterprises. Especially for the top management of the energy enterprise, how to ensure that the energy enterprises of a number of energy projects in line with national and corporate strategic requirements, to become a new research topic in the field of energy project management.

The development of new energy industry requires the guidance and encouragement of the local government policy, and the government's policy incentives are also confirmed by the relevant national practice will effectively promote the development of new energy industry. How to build an efficient local new energy industry incentive policy system has always been a local provincial and municipal government is concerned about the hot issues. Combined with the experience of the new energy industry in the development of a good country for China's new energy industry and its incentive policies in the design of the specific policies, including macroeconomic policies, the concept of new energy incentive system framework our recommendations for the construction of local government incentives from the policy micro level are as follows.

- Policy to promote the city within the area of photovoltaic power generation products and building a combination of the good photoelectric building integrated planning guidance to determine the installation price subsidies, strong guidance and expand the integration of the photovoltaic building photovoltaic market development.
- Divides the target to apply the new energy all levels of the government purchase standard step by step explicitly that is clear about various stage specific objectives.
- Limited time specific research organizations, the establishment of new energy technology standard and product standard certification system as soon as possible (especially the new energy product quality standards, technical standards grid connected photovoltaic building standards).
Financial subsidies, charging policy. According to the actual situation and the budget and the use of funds to subsidize the use of new energy production enterprises for the technology development-related costs, the financial real income, or for relief.

Diversified financing policy. Improve the special development of new energy fund rules as the formation of effective financing mechanism promote the diversification of financing channels and social cooperation, promote cooperation and promote commercial bank to encourage new energy industry and international organizations.

**The Energy Game Analysis and Modelling.** At present, conventional energy is still the main body of energy use, it relates to a country's security and sustainable development. The study of the world's conventional energy exploration and use of the situation, the development of new energy and ecological environment and the other issues help to grasp the world's energy bottom line that develop a rational development of new energy strategy in the future energy competition to take the initiative.

This paper considers cooperation with foreign countries as the main form of cooperation, and that regardless of international energy cooperation mode is what form, and ultimately participate in the international energy cooperation is the micro-level behavior of energy enterprises. So the evolution of foreign energy, business and local energy companies and the evolution of the interaction between the rules of cooperation or "system" form has become the focus of this paper. This paper international energy cooperation system that establish an evolutionary game model to reflect the evolution of spontaneous communication process of international energy companies and rules of communication, in-depth analysis of its dynamic evolution, in order to reveal nonlinear characteristics of international energy cooperation and its dynamic evolution path, and we conclude the listed results.

- Cooperation and cooperation cost is an important parameter in the evolution of international energy cooperation system. They are both the state variables and the decision variables.
- In the process of cooperation, we must adhere to the principle of maximizing the benefits of cooperation, while considering the interests of both sides in the long-term perspective, the establishment of a stable strategic partnership, to achieve a win-win game process.
- The steady state of evolution depends not only on the learning speed and direction of both sides of the game, but also on the initial state of both sides of the game.

**Conclusion**

In this paper, we conduct research on the game theory and logic optimization and the applications on construction of China's new energy subsidy system. Energy is an important material basis for national economic and social development and plays an extremely important role in ensuring the development of the national economy, promoting social progress and raising the people's living standards. The management of energy and the general optimization of energy structure play an important role in the development of the national economy and the upgrading of industrial structure. Therefore, it is the inevitable choice to build a well-off society in an all-round way. Energy recycling economy system is a subsystem of the system of circular economy, in the whole process of energy resources, production, product consumption and waste, the traditional linear dependence on energy consumption growth of economic system transition to relying on the ecological energy resources development cycle without economic
system. Under this basis, this paper proposes the China's new energy subsidy system, in the later time we will test the performance of the method from the systematic level.

References


