

# **Strategic Planning for Promoting Practical Knowledge of R&D Organization: A Case Study in the National Iranian Gas Company and Subsidiary Companies**

**Ali Massaeli  
Research and Technology Directorate  
National Iranian Gas Company  
I.R. of Iran**

## **Abstract**

New-born organization of R&D in the National Iranian Gas Company (N.I.G.C) was formed nearly a decade due to response of its technological needs. One of the most important promotion factors of such these organizations is "increasing the levels of practical knowledge in different fields of main company needs" and this parameter will be unreachable without strategic planning based on R & D road-map. In this research the different scenarios was suggested for promotion of the employees in R & D organization and the other researchers. After that the planning has been done for short-term, mid-term and long-term; and the execution is ongoing. In every planned session all the feed-backs are collected, categorized and analyzed for continues improvement based on Deming cycle.

## **Keywords**

R & D Organization, Strategic Planning, Promotion Scenario, Feed-Back, Deming Cycle, Training Standards

## **1. Introduction**

Iran has the 2<sup>nd</sup> largest reservoir of natural gas in the world (according to BP reports at the end of 2010<sup>[12]</sup>) and the 4th largest producer of natural gas in the world (according to BP reports at the end of 2010<sup>[13]</sup>) and N.I.G.C is the only operator for handling this production as the full cycle, production, transferring, distribution, engineering and exporting of natural gas in Iran. National Iranian Gas Company (N.I.G.C) as one of the four major subsidiaries of Iran Petroleum Ministry was established. The initial capital of the company amounted to RLS 25 billion, in 1965. Since its establishment, N.I.G.C has gradually achieved capabilities and has managed to have access to various sources and facilities such as experts and efficient human force equipped with scientific and theoretical vision and knowledge; tools, equipment, machinery and various advanced workshops for implementing its operations proportionate with the country economic and social development trend. N.I.G.C has also benefited from gas, which is one of the major fuels used for energy production and providing a part of the required currency of the country. At present, N.I.G.C is carrying out its tasks in compliance with international valid standards on its own. Right now, N.I.G.C is one of the top ten gas companies in the gas industry in the Middle East, and one of the four major subsidiaries of the Petroleum Ministry. Being responsible for providing over 61 percent of the country-required fuel, it has over 45 years experience. The company, in terms of providing gas, has an important position both inside the country and abroad. In line with this, and proportionate with its needs and expansion of its activities in the country and abroad, N.I.G.C has taken measures to revise its structure. While maintaining and reinforcing its potential in terms of hard ware and soft ware, N.I.G.C has recruited experts and/or trained staff, and has updated its experienced staff knowledge.

At present, the number of N.I.G.C permanent staff amounts to 18000 persons, meanwhile, over 18000 contractor staff works with N.I.G.C. National Iranian Gas Company is comprised of 6 affiliated companies active in various activities such as gas treatment and dehydration, gas transmission, gas engineering and development, and commerce. The affiliated companies supervise the activities of some independent directorates. At present, N.I.G.C is one of the four major subsidiary companies of the Petroleum Ministry. The chairman of its general assembly is the esteemed president and the chairman of its Board of Directors is the Petroleum Minister. <sup>[10]</sup>

## **Gas Sector Objectives and Policies in the 2025 Outlook<sup>[10]</sup>**

Based on the outlook 2025 documents, in the petroleum industry the funds resulted from oil and natural gas including gas condensates and gas liquids sales after deducting amortization costs is not considered as the government's revenue. In other words, selling these resources is merely considered a national asset and wealth, which should be converted into generating capital to maintain continuous fertility and natural wealth. One of the other objectives determined in the outlook document is that Iran should have control over 10 percent of the total amount of gas traded all over the world. Based on these objectives, some mechanism created in gas industry should pave grounds to enhance gas production rate to reach 500 BCM per year. It is worth mentioning that the United States of America with gas reserves of one fifth of Iran, produces five times more than Iran. The US gas reserves accounts for about 3 percent of the world's gas reserves, while that of Iran accounts for 15 percent of the world's gas reserves. Even Canada, which has 1.17 of the world's gas reserves, produces two times more than that of Iran. Based on the outlook document forecasts, through attracting domestic and foreign capital, Iran fulfills this great and important objective. Removing inefficient bureaucracy is another effort made to materialize Iran's position in the outlook document. According to experts, due to limitation in state investment resources, efforts should be made to absorb more private domestic and foreign capital rather than merely relying on state resources in the oil and gas industry. Petroleum sector is so attractive to foreign investors are ready to develop energy sector in Iran in desirable conditions. Therefore, through investment in other sectors, which are not of interest of foreign investors, the government can succeed to promote gas and convert it into a national capital rather than remaining as a natural resource, in compliance with 2025 outlook document.

On the other hand, according to the program defined in the 20-year outlook of the country, oil production is expected to reach one bbl/d and with respect to our gas reserves, which amount to 1000 TCF, gas production is expected to reach 50 BCF/d. Our current production is over 500 MMCM /d, which is expected to reach 1.4 BCM in the horizon of the 20-year outlook. The current crude oil production capacity is 4.3 mbl/d, and is expected to reach 7 mbl/d including gas condensates according to horizon outlook. The point indicates that our oil and gas industry requires between 400 and 500 billion dollars investment. At present, desirable measures have been taken to absorb foreign investment in oil and gas fields. For example, in late 2009 and early 2010 Iran has reached agreements with ONGC of India to invest in Farzad gas field with reserves amounting to 12.5 TCF. In the first phase, \$3.5 billion is supposed to invest; and in the next step where the LNG project comes into stream, the investment rate is expected to reach \$7 billion. Kish gas field with reserves amounting to 48 TCF gas requires \$ 10 billion. Negotiations have been conducted with a European company concerning converting natural gas of Lavan gas field into LNG, which requires between 6 and 7 million dollars investment. Lavan gas field reserves amounts to around eight TCF. All the earlier mentioned issues indicate that the range of activities of N.I.G.C provides a high potential for capital absorption. There are various big and small fields in the Persian Gulf, which require different levels of investment ranging from between \$200 million and 16 billion with respect to the type of the field. Therefore, benefiting from the capitals of Iranians in the country and abroad is one of the greatest motivations of oil and gas industry.

As mentioned earlier, since 2005 N.I.G.C took measures to establish Gas Engineering and Development Company so that it would absorb domestic and foreign investment to implement projects to make the company approach the outlook objectives. In line with this and based on the executive system of oil industry projects, Iranian Gas Engineering and Development company is responsible for implementation of N.I.G.C master projects. The company is the biggest company in N.I.G.C, in terms of the volume of the under implementation projects; and 70% of the required credit for carrying out projects is provided by Iranian Gas Engineering and Development Company. The company is also responsible for implementation of 12 major projects including design and construction of gas transfer pipelines, pressure boosting stations, development of gas processing plants and infrastructure facilities. The under implementation projects worth over RLS 200,000 billion; and the entire approved credit for the company in 2009 has amounted to RLS 40,000 billion.

N.I.G.C Strategic Objectives N.I.G.C major objectives can be surveyed in two different sections: national and international. In both sectors, the main principle is customer satisfaction, financial credit achievement and productivity. In line with this and based on the outlook document, N.I.G.C aims at ranking the third among natural gas producers in the world to achieve 8 to 10 percent of the global gas trade share. The second objective of N.I.G.C is ranking the first in the region in terms of gas technology.

- 1- Plans and policies of N.I.G.C in international level and ranking the third in the world; and achieving a share of 10 percent of natural gas trade in the world
- 2- Processing about 1050 MMCM /d of natural gas
- 3- Enhancing production capacity while prioritizing joint reservoirs, especially South Pars
- 4- Enhancing natural gas share in the energy basket of the country by 70 percent, through substituting liquid oil products with natural gas
- 5- Making efforts to export natural gas to neighboring countries through pipeline, other countries in the world and far east
- 6- Exporting LNG
- 7- Attracting foreign investment through capital markets and/or joint projects
- 8- Firms running vision and improving structure to maximize profitability and competition in international market
- 9- Maximization of value added through using gas in energy consuming industries and/or establishment of industries like GTL
- 10- Reinforcing private sector in downstream and gas distribution industries
- 11- Cooperation with the countries in the region in production and transmission affairs
- 12- Impressing gas management status in the region
- 13- Benefiting from natural gas adjusting pricing system
- 14- Complete privatization of natural gas in Iran

A Glance at N.I.G.C Production and Processing Facilities Indicates Achievement of a Higher Rank in the Global Trade Balance with respect to the natural gas share in the fossil energy carriers basket and the 40 year valuable experiences in the gas industry activities in terms of hardware and software, N.I.G.C has a high potential, and is considered to be among the major gas companies in Iran and the Middle East. As much as consumption rate has gone up, and based on the horizons developed in the development outlook; natural gas production, processing and dehydration capacity has had a growing trend to meet the new requirements. In addition, the growing trend is recommended to be continued proportionate with development projects. The estimates indicate that in 2012, Iran's gas processing capacity will stand at 274 BCM per year, in other words it will be equal to the 55 percent growth rate during the next years. Without operating its development projects, N.I.G.C is capable of processing 500 MMCM /d of gas. As it was mentioned earlier, at present, N.I.G.C is responsible for management and operation of seven independent and private processing companies. According to the estimations, by 2025, the number of gas processing companies is supposed to be doubled through carrying out development projects. Predictions indicate that in case all the gas processing development projects are materialized, by the end of 2025, the total processing capacity of N.I.G.C will amount to over 1200 MMCM/d.

### **1.1 The R&D Organization <sup>[9]</sup>**

The R&D organization of the National Iranian Gas Company (N.I.G.C) was established on 2003 based on predefined vision and mission of this great company. Now a day regarding to the science growth and inclining toward research and technology development specially in industrial sectors to achieve a sustainable development, the countries are trying to increase their scientific and research approaches in several aspects. The main index in the development scales and the economic growth and social welfare is the capability to achieve the new technologies in this era. In fact, reaching to the new technologies is impossible without utilization of scientific principles of

technology management. As a road-map in 2025 horizon outlook all the activities in short-term, mid-term and long-term planned for I.R. of IRAN, and the goal of research and technology field was planned to achieve the knowledge-based development as one of the most important responsibilities of the governmental organizations, during the fourth and fifth development plans of the country fulfill the objectives. Based on above statements, The Research and Technology directorate of N.I.G.C is responsible for the scientific development and promoting the technology requirements of gas industry, stabilizing appropriate infrastructures for achieving the goals and objectives. One of the important responsibilities in this field, training the expert human resources to handle the tasks and maximizing the utilization of limited resources and deterring the essential strategies, identifying the research priorities and planning the effective and demand-oriented research plans and implementing the most important goals. The company has foreseen plans including interaction with the countries and companies which own advanced technology, establishment of a centre for promotion and improving modern oil, gas and petrochemical industries' technologies in the Persian Gulf and strengthening research and development institutions of domestic research centers.

## **Vision**

" To be the 1<sup>st</sup> technology power in the middle-east region in 2025 outlook"

Regarding the N.I.G.C vision which is developing the customer orientation processes, increasing the production rates, updating the Iranian development networks, is to respond the technological needs of this company and applying the technical acquired knowledge from R&D projects.

## **Mission**

R&D mission is presenting the highest quality projects outputs for customers and institutionalizing the optimum natural gas consumption culture the same as other N.I.G.C sectors. (Regarding to this fact that according to the BP statistics in 2010 the energy intensive per GDP in Iran is more than 2.5-3 time more than world average rate).

## **Goals**

- Long-term, mid-term and short-term planning by research and development based on the vision of I.R. of IRAN 2025 research and technology outlook
- Institution of research and technology development in deferent sectors of N.I.G.C.
- Institution of technology management and attempting to improve the current methods and procedures based on the scientific principles and developments.
- Empowering the position of N.I.G.C in the international gas industries association by training the expertise of human resources
- Conducting future research studies to define the technology development path needed by the N.I.G.C.
- Extracting the real technological needs of the company and defining research projects based on need assessment in different sectors.
- Offering the required laboratory services vastly by constructing the reference laboratories and using the domestic and international capabilities.
- Changing the attitudes toward R&D and organization structure
- Optimizing organizational process effectiveness
- Equalizing the resources based on future needs
- Developing core-competency and change management
- Empowering the HR to be fitted in their jobs
- Applying the acquire technical knowledge

## **Strategy**

- Planning for promoting and developing HR based on strategic HR framework
- Policy making for improving the optimum usage of energy intensives in all sectors
- Integration of internal policies
- Internal networking and re-defining the relations for decreasing discrepancies
- Strategic planning for choosing the expert stuffs and applying the qualified HR
- Integrity of the procedures with ministry of petroleum of Iran.

### Fact and Figures of N.I.G.C R&D Departments

The facts and figures of NIGC are shown in Tables 1, 2 and 3. In year 2010 the research project statistics is in Table 2. Figure 1 depicts the project distribution based on projects objectives in 2010. Figure 2 compares project distribution based on number of Projects in 2010. Also Figure 3 shows project distribution based on number of Projects in 2010.

Table 2: N.I.G.C. structure

No. of R&D Staffs	No. of Gas Processing Co.	Gas Transmission Co.	Provincial Gas Co.
132	8	10 regions	30

Table 2: N.I.G.C. R&D finalized projects in 2010<sup>[11]</sup>

Main R&D	Gas Processing Co.	Gas Transmission Co.	Provincial Gas Co.
25	3	2	24

Table 3: N.I.G.C. R&D unfinished projects in 2010<sup>[11]</sup>

Main R&D	Gas Processing Co.	Gas Transmission Co.	Provincial Gas Co.
24	21	9	77

Table 4: The supported MS. And PhD final projects in 2010<sup>[11]</sup>

MA-MSc	PhD.
76	7

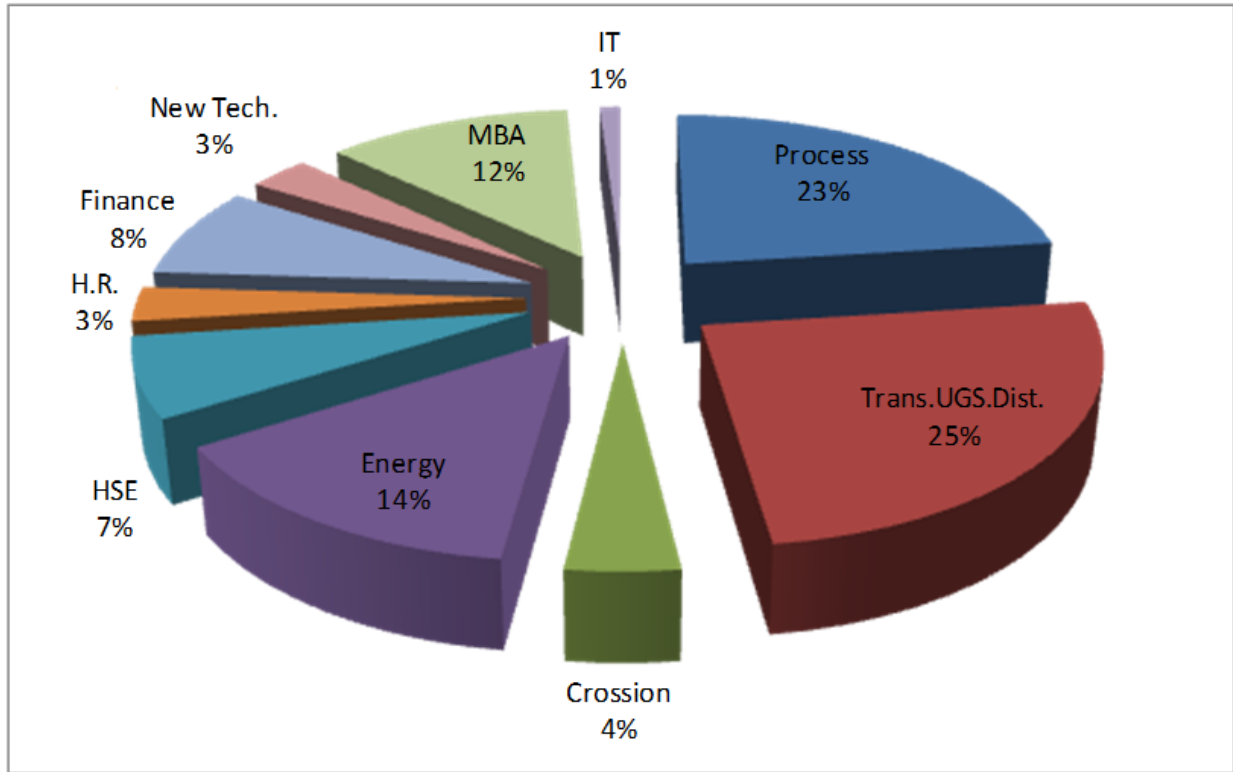


Figure 3: Project Distribution based on Projects Objectives in 2010<sup>[11]</sup>

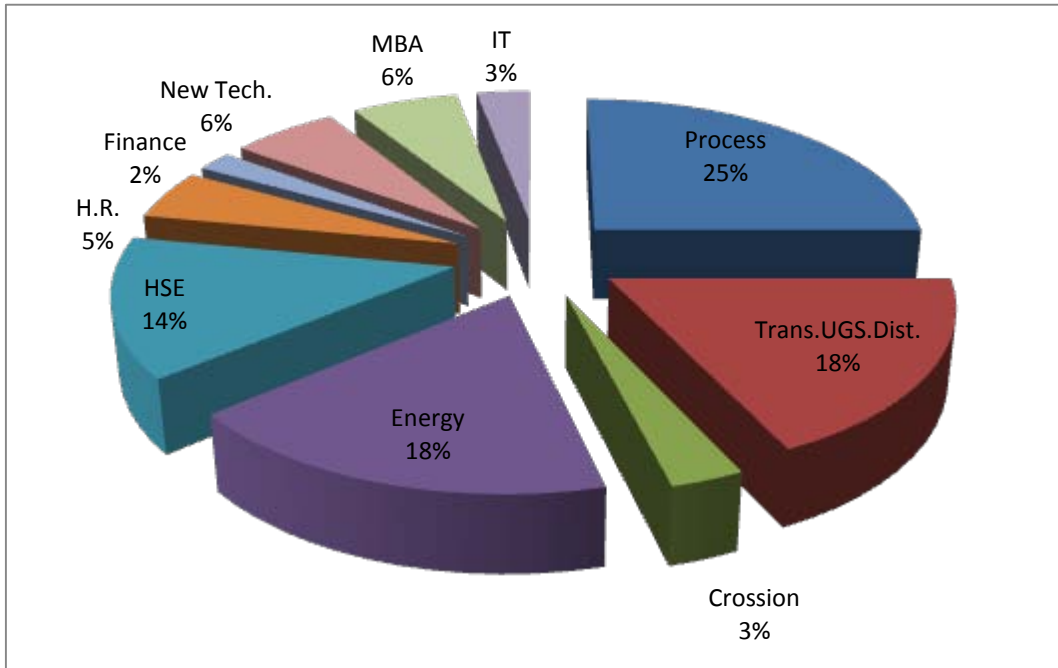


Figure 2: Project Distribution based on number of Projects in 2010<sup>[11]</sup>

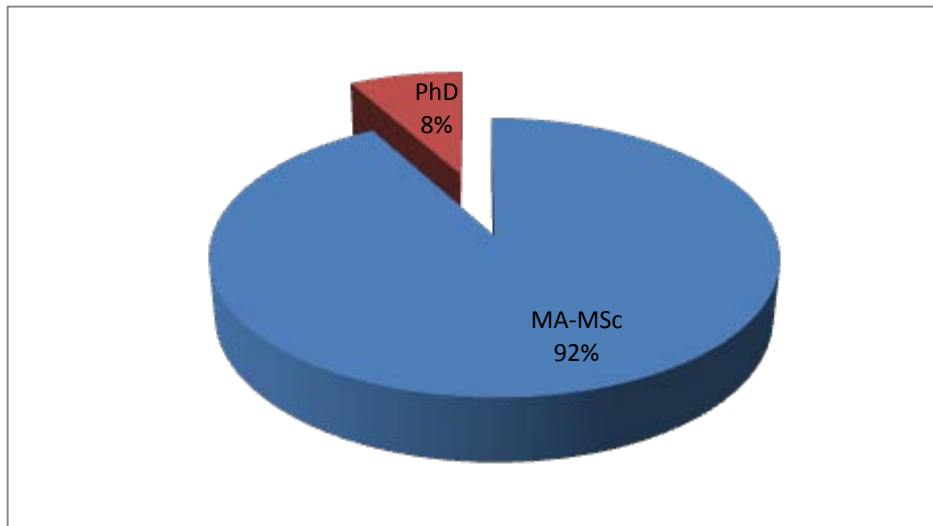


Figure 3: Project Distribution based on number of Projects in 2010<sup>[11]</sup>

## 2. Literature Review

### Strategic planning history

Ramanujam et al. (1986)<sup>[1]</sup> suggested seven dimensions for studying strategic planning processes: system capability; use of strategy tools and techniques; attention to internal facets; attention to external facets; functional coverage; resources provided for planning; resistance to planning. Ramanujam and Venkatraman (1987)<sup>[2]</sup> then used all dimensions from the previous model to study strategic planning processes except for one dimension; namely, system capability. Yasai-Ardekania and Haug (1997)<sup>[3]</sup> identified six characteristics of the strategic planning process. These characteristics were process formality, size of planning effort, process sophistication, planning horizon, and the extent of the involvement of the CEO and top management and line management in the planning process.

The previous empirical studies on strategic planning in different industry contexts, including the hospitality industry, and in different country contexts, have emphasized the most common and most important dimensions for studying it. Therefore, this study has adapted these dimensions to examine strategic planning in N.I.G.C R&D. These dimensions include participation and involvement in strategic planning; the time horizon for planning; environmental scanning (internal and external); planning techniques; and functional coverage. Top management has an important role to play in the encouragement and introduction of strategic planning (e.g. Koufopoulos and Morgan, 1994<sup>[4]</sup>; Ramanujam et al., 1986<sup>[1]</sup>; Ramanujam and Venkatraman, 1987<sup>[2]</sup>). The literature (e.g. Oswald et al., 1994<sup>[5]</sup>; Wooldridge and Floyd, 1990<sup>[6]</sup>) indicates the importance of middle managers' involvement in strategy formulation to their commitment to the strategy.

### **N.I.G.C Strategic planning Characteristics**

- The strategic plan is supported by CEO and top management
- The process is done by all the sectors not only by the planning sector
- Flexibility based on N.I.G.C sectors and its specification
- Responsibilities and planning milestones are clear for all and its increase the reliability
- Sensitive to complex and dynamic environmental changes
- In case of facing with unpredicted results and consequences is realistic and the analysis is done systematically.
- The suggest actions are promoting
- In case of disagreement the convergent method is suggested
- The procedure is dynamic and change periodically based on Deming cycle

### **3. Methodology**

The research was conducted using field study methods and the main instrument used for collecting the evidence was semi structured interviews. The strength of this approach is that it focuses directly on the research topic, provides perceived causal inferences (Yin, 1994)<sup>[7]</sup>. With prior consent from the interviewees, all the used documents and presentation are allowed to publish from research and technology directorate.

### **Planning Procedure in N.I.G.C**

Based on Decision Theory the following procedure is done periodically by planning sector:

- Determine the current condition
- Define the target condition (goals in terms of short-term, mid-term and long-term planning)
- Gap analysis and strategic planning for reaching the goals
- Applying of the feed-backs (Analysis and Control) using continues improvement (Deming cycle including goals, attributes, measuring the results or effectiveness, gap analysis, cause analysis for gaps, corrective actions)

### **HR Strategic planning**

All the planning activities affecting the HR promotions which push them towards organizational strategic needs are considered as human resource strategic planning in N.I.G.C and one of the most important of them is strategic training. As it was mentioned the N.I.G.C R&D department is so young and has no experience for handling pre-defined vision, mission and the goals based on this, the importance of HR strategic planning is clarified.

### **Strategic planning for promotion of R&D HR in N.I.G.C**

- *Current condition:*  
Gathering information of pass training courses from R&D HR
- *Define the target condition and gap analysis:*  
Based on job duties and project orientation objectives of HR the training courses and syllables are defined by training comities
- *Planning for execution:*  
The courses are planned for mid-term and long-term according to schedule and its included practical OJTs (On the Job Training).

- *Analysis Feed-backs and control:*  
It was decided to gather and analysis the feed-backs of the courses from trainees for corrective actions.
- *Corrective actions:*  
In order to facing discrepancies between the defined training targets and feed-backs the corrective actions should be performed as well.

#### **4. Discussion of the Findings**

The N.I.G.C is the most important provider of natural gas in I.R of IRAN. The R&D department was the last department which was established on year 2003 and the most of the HR are selected among the universities top students, so the lack of experience and needs for strategic planning for empowering the HR is clarified. The planning procedure are de-centralized and extended toward the R&D department and has been done regarding the training department procedures in corporative with R&D and other sectors. The attributes for evaluation the effectiveness of training courses has been defined in training comities. At the moment the training department is planning the standard courses in a schedule program. For short-term the experts is planned to participate in related conferences and have paper regarding their activities, for mid-term and long-term the training department is planned to have a scheduled program for R&D experts.

#### **5. Summary and Conclusions**

The objective of this research was defining a framework of strategic planning for new-born R&D department in energy provider Company in I.R. of IRAN and different types of domestic subsidiary and understand the extent to which these approaches were perceived to be effective. The main conclusions that can be drawn from evidence gathered from the companies studied in this research are:

1. Responsibility for strategic planning is increasingly being decentralized from planning sector and extended to the studied department (R&D)
2. The focus of this strategic planning was empowering the R&D HR to handle their responsibility and push them toward the strategic targets
3. The strategic planning in N.I.G.C is dynamic activity which is design and improves by all the sectors and uses the continues improvement

#### **Acknowledgements**

As the organizer of this project, hereby it should be thank for all the N.I.G.C management and CEOs and R&D experts to have a corporative behavior to do this job, unless this job could not be done without their helps; also special thanks for conference organizers and the jury team.

#### **References**

1. Ramanujam, V., Venkatraman, N., and Camillus, J., Multi-objective assessment of effectiveness of strategic planning: a discriminant analysis approach, *Academy of Management Review*, vol. 29, no. 2, pp. 347–372, 1986.
2. Ramanujam, V., and Venkatraman, N., Planning system characteristics and planning effectiveness. *Strategic Management Journal*, vol. 8, no. 5, 453–468, 1987.
3. Yasai-Ardekania, M., and Haug, R., Contextual determinations of strategic planning process, *Journal of Management Studies*, vol. 34, no. 5, 729–767, 1997.
4. Koufopoulos, D., and Morgan, N., Competitive pressures force Greek entrepreneurs to plan, *Long Range Planning*, vol. 27, no. 4, 112–124. 1994.
5. Oswald, S., Mossholder, K., and Harris, S., Vision salience and strategy involvement: implication for psychological attachment to organizations and job, *Strategic Management Journal*, vol. 15, no. 6, 477–489. 1994.
6. Wooldridge, B., and Floyd, S., The strategy process, middle management involvement, and organizational performance, *Strategic Management Journal*, vol. 11, no. 3, 231–241. 1990.
7. Yin, R.K., *Case Study Research, Design and Methods*, 2nd ed. Sage Publications, Newbury Park. 1994.
8. <http://www.nigc.ir>
9. National Iranian Gas Company Research and Technology Directorate Introduction catalogue.
10. H. Omidvar, Latest Developments in the Iranian Gas Industry, *Energy and Echology*, vol. 120, no. 6-7, 2011,



11. Performance Abstract of Research and Technology Directorate of N.I.G.C
12. [http://www.bp.com/liveassets/bp\\_internet/globalbp/globalbp\\_uk\\_english/reports\\_and\\_publications/statistical\\_energy\\_review\\_2011/STAGING/local\\_assets/spreadsheets/gas\\_table\\_of\\_proved\\_natural\\_gas\\_reserves\\_2011.xls](http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2011/STAGING/local_assets/spreadsheets/gas_table_of_proved_natural_gas_reserves_2011.xls)
13. [http://www.bp.com/liveassets/bp\\_internet/globalbp/globalbp\\_uk\\_english/reports\\_and\\_publications/statistical\\_energy\\_review\\_2011/STAGING/local\\_assets/spreadsheets/gas\\_table\\_of\\_natural\\_gas\\_production\\_billion\\_cubic\\_metres\\_2011.xls](http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2011/STAGING/local_assets/spreadsheets/gas_table_of_natural_gas_production_billion_cubic_metres_2011.xls)