

NEW STRATEGIES FOR THE MEXICAN PETROCHEMICAL INDUSTRY

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ABSTRACT

It is necessary to define new strategies for achieving a proper growing and development of the Mexican Petrochemical Industry. As each product can be used as a final product or as raw material the influence of its production is remarkable all over the national production chains. Petrochemicals in Mexico have been classified as basic and secondary ones, by political reasons. These two groups allowed governmental institutions to regulate private activity versus public activity in this sector. At the beginning, the first group was devoted to the first chemical transformation and the secondary one to subsequent transformations. For last 30 years, petrochemical industry has not been developed as the Mexican people wanted. The trends showed that total production has remained at the same level, many installations were left out of service and imports grow very fast. The official explanations to justify the present situation of Mexican Petrochemical industry are diverse : low investments, reduced scale sizes of plants and **uncertainty** in government rules for new investors and **for** gas price as a raw material. These are the main reasons which explain the lack of competitiveness in the global market That is why this paper focuses the strategic problem of how to rescue this industry and how to promote a new outline for achieving the desired development.

Keywords: petrochemical chains, strategies , regulation.

PROBLEM DEFINITION

Petrochemical industry production has been held up for 30 years. Many installations were closed and investment along this period was very low. The economic criteria for managing the production were very poor so the petrochemical activity contribution to Mexican development has been also limited. Several economic crisis in that period had as a result the breaking of production and value chains, then several petrochemical imports were needed and it was no possible to maintain the activity integrity.

SYSTEMS APPROACH

Studies of petrochemical activity require managing a very high complexity because they have many factors to be considered and involve great amount of resources. A system approach is necessary due that this activity has many systems and subsystems of lower range and a multiplicity of interactions between them. The whole system is becoming more complex every day-

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It is necessary also to have a methodology of changes in order to introduce actions to solve the problems of the complete chain of systems. In this case, the whole system is composed by concepts, entities, organizations, norms and many man-machine systems.

In the petrochemical activity we have both problems: **improvement** and **design** : improvement of existing installations and **design** of a set of new components. Improvement of a petrochemical whole system is for ensure that a designed system performs according to expectations. Now the system does not yield predicted results and operation and has many fails compared with the system initially designed.

After five or six decades of evolution of the system there are many reasons to redesign the original Mexican petrochemical system. But in this opportunity we only pretend to define the proper strategies for a new system.

MEXICAN PETROCHEMICAL INDUSTRY EVOLUTION

As the Mexican petrochemical industry emerged from the petroleum industry that belonged to Pemex, the main state's company, its strategies came from the public administration in each six-year governmental period. Following it is presented a resume of the evolution of this industry by period from the sixties up to now.

1964-1970 The starting of Mexican Petrochemical Industry was an effort of industrial planning, according to demand, production processes, needed specific products and available raw materials, which was carried out at the middle of the sixties.. At the end of this period Mexico had 10 production centers and 25 chemical products. Besides, the Mexican Petroleum Institute was created to develop new petroleum technologies.

1970 – 1976 11 Production Centers started operation, the adopted policy was imports substitution. The products categories were according to raw materials : methane, ethane, propane, butane, sulfur and naphtha. In that period petrochemical industry grew at a 12% annual rate.

1976 – 1982 This period was the most dynamic and ambitious in term of investment of Mexican Petrochemical Industry. So Mexico had the 5th position in exports in all over the world. The planning criteria was regional, improving efficiency through resources used, raw material and investment Unfortunately imports were also high and net balance was not completely favorable. In this period petrochemical production grew 20% annual rate as a consequence of the great investment applied.

1982 – 1988 In this period, emphasis was put on production improvement, investment was lower than in the previous period. Petrochemical industry was opened to participation of foreign and national private investments. A new classification of petrochemicals was adopted. Two branches were created in the organization, one for managing basic petrochemicals and other for secondary ones.

1988 - 1994 The main action of the board of directors was to close 50% of the existing plants. The main reasons for this action was technological obsolescence and insufficient scale size of the plants. Privatization process continued and many financial decisions were taken : debt restructure and organization changes; in 1992 petrochemical centers changed and a set of subsidiary organs were created to manage selected business.

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1994 – 2000 Pemex Petroquímica was the name of the company, as a part of PEMEX, which in this period tried to improve the performance of this industry. As a first step, it followed the same strategy that was adopted in the past, trying to separate the non strategic activities from the production centers, which were transformed in seven branches with variable capital. The operation of new enterprises did not affect the existing ones. In that time it was a high offer in the international market, so internal market was diminished in 15% and national production of petrochemicals in 13.4%, except ethane chain. The annual program was devoted to operation improvement, a better industrial safety and environmental protection.

Following three governmental periods 2000- 2006, 2006. 2012 and 2012. 2018 were influenced by the same ideas about petroleum energy, petrochemical activity and economy. The directors proposed and managed the same general policies. The difference between them were many detailed norms, their advances in implementation and their executive capacity to achieve the changes in terms of new investments and results.

Several actions were focused to improve competitiveness of petrochemical plants and to restructure the production chains.

In fact Petrochemical industry did not modernize their installations because government wanted to change everything at the same time: structure, policies, productivity and results. Then the main change was the proposition of a new schema with a set of norms, laws and procedures. The results were unsuccessful.

Petrochemicals market is affected by oil price. When it increases the market shows instability, product shortage, high demand and high prices. Now it is hard to forecast oil prices. In short term there are no signals of oil price recuperation.

Mexican petrochemical industry, for several decades, had as main products: dodecyl benzene, ethylene, polyethylene, benzene, ethyl benzene, cyclohexane, chloro ethane, styrene, vinyl chloride, ethyl-chlorohydrate, sulfur. Other products were added later to offer: acrylonitrile, polyethylene, ethane, ethylene oxide, dichloro ethene, chlorohydrate, acid desparaffinants, demulsifiers, paraxylene, ammonia, hydrogen, butadiene, and propylene.

MEXICAN PETROCHEMICAL INDUSTRY DIAGNOSIS

In Mexico, the development of Petrochemical Industry is based on natural gas as a raw material. That is why oil reserves are important.

Mexico is a producer and a consumer of natural gas, so there is a competence for its different uses. LNG, liquefied natural gas, is not very common in México, so it is not used as a raw material for petrochemicals. Looking the balance between offer and demand of natural gas, it seems necessary to include this possibility for supply in the future.

From the sixties to eighties, Mexican petroleum industry had a nationalist focus. After that period policies changed to create an open market through private investments.

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In 1986 it was performed a first classification of petrochemical products in two categories : strategic and secondary. Production corresponding to the first group was reserved for Mexican state and the second for private companies.

Since that time, several changes were made in policies always trying to diminish the number of strategic petrochemicals in order to achieve private enterprises interested in their production to invest in Mexico.

Legislative changes came out and modified petrochemicals classification during twenty years. At the same time Mexican public investments were diminishing in petrochemicals creating a situation that made easy to introduce a new privatization process.

In this way, the strategic character of some petrochemicals was lost and so more and more were considered secondary ones according with governmental norms. The main purpose was to promote investments for Mexican petrochemical industry from private enterprises-

On the other hand , the financial situation of the Mexican petroleum industry, due to the excessive charge given to Pemex for supporting the public budget, made almost impossible for this enterprise to have available resources to invest in Petrochemical industry. Mexican government has been for many years dependent of resources generated by petroleum industry so the fiscal charge has been very high..

Of course in this situation, technology became very old and technology management very poor. Pemex as a company did not have enough money to acquire new technology in spite of having important amounts of oil production.

In my opinion policies have been wrong and the results have been very inconvenient for PEMEX and for the country. If policies would have changed trying to keep a good economic balance between investment in exploration, oil production, plant reengineering and refinery configuration, perhaps it would had been possible to have a better financial results in PEMEX.

In resume, the main problems of the Mexican Petrochemical Industry were provoked by policies and practices. There are several factors to be analyzed, before to formulate a whole plan. The macro aspects are : policies modification through legislative changes, which should solve problems as lack of investment, maintenance, obsolescence, selection and size of new plants, competitiveness and projects integration.

Mexican government has tried to impulse a private advance in the capital composition of that sector. But its results have been not very significant up to day.

Poor criteria applied respect to Technology Management, had as a consequence frequent decisions to take plants out of operation , closing most installations that ten years before were working. Besides, a poor supply of raw material, natural gas, left several plants without enough production.

Closing of plants of many petrochemicals caused the breaking dawn of product chains. Then this industry was left completely devastated.

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Profitability and Obsolescence and gas supply were three factors not well studied for improve economic results of the whole Mexican industry.

As a resume, the main problems detected in the diagnosis are:

- Lack of investment for many years
- Many plants out of operation
- Production chains were broken
- Poor supply of natural gas
- Maintenance programs were irregular and abandoned
- Clear obsolescence in many processes
- Technology Management almost inexistent
- Change of Policies in each governmental administration
- No sufficient technical and economic studies to support decisions.

PRESENT POLICIES AND STRATEGIES

Recently in Mexico an ENERGY REFORM is being carried out by government. It affects also Petrochemical Industry. In last three years Mexico has changed many important parts of its legislation related to hydrocarbon energy. In 2012 and 2013 several constitutional changes were made and there are still many changes that are in process of modification in secondary laws or specific norms..

In this paper we are reviewing mainly the changes that are affecting the oil transformation in refinery products or petrochemicals. The official entity put in the market a new model for production of petrochemicals. It was eliminated the restriction that private industry had to participate in the processing of natural gas to obtain petrochemicals and little by little all restrictions to import natural gas have been canceled.

Policies and strategies in different governmental periods were changing as each specific government defined its position in matter of economics. When governments belonged to decades 60's, 70's and 80's were more interested in obtaining results as a producer state, with great power and trying to apply a director role over other enterprises

Although as available resources were not enough, the efforts for building a great industrial capacity in petrochemicals did not give a good capacity to be competitive. Financial productivity of the industrial plants was not very high, so the return rate was not very attractive so it was necessary to improve economic results.

.STRATEGIC CHANGES AND GENERAL CONCLUSION

After several changes in the legislative framework of Petroleum and Petrochemical industries it is hard to analyze all related factors for improving the arena and for giving a

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new impulse to this industry. There are new criteria in government but there is also the same inertia pushing down this industrial activity.

Then the selected strategy was to identify new business projects with economic advantages and higher added value to offer them to new partners.

The most important point to be changed is to increase the growing rate of this sector. In spite of International interests are put on Mexico and most new laws were approved by the Parliament, the main problem is that new set of policies, actions and decisions have not been effective and results have been irrelevant

Put together the new pieces of the political framework, take all planned decisions and be efficient to obtain all results through of a real executive capacity. Then the main problem is “ How to achieve the integration of the new schema for the MEXICAN PETROCHEMICAL INDUSTRY,.

Following a list of ten points are presented in order to resume the main changes necessary to formulate the new strategies that should be adopted :

- 1 Policies have to be reviewed given that Mexican norms related to energy have changed recently The new framework opened this industry to private investments.
- 2- Secondary laws and detailed norms have been defined little by little but there are not complete. It is important to be sure respect to the content of them and to complete the normative framework
3. It is convenient to plan a new stage for the petrochemical industry putting together again all the production chains in a new model to complete each chain with investment, marketing relations and economic studies, to conform a project portfolio.
- 4- Gas supply should be assured by means of an economic agreement between : PEMEX and each new investor.
- 5- Freedom to import natural gas achieving a convenient gas price should be applied as a new policy in order to give confidence to investors by means of long range contracts.
- 6 Restructure productive chains selecting productive business lines and projects.
- 7 Improvement of competitiveness of existing plants in operation--
- 8 Perform actions to study deeply obsolescence of old plants to justify its closing, increase of capacity or revamp.
- 9 Organize expert meetings to review and discuss the new plants for restructure production chains.

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- 10 Carry out technical studies to evaluate economic feasibility to justify investments.
- 11 Design a Technological Management Plan, a Maintenance Plan and a Process Reengineering in order to define technical and economic studies for old plant rehabilitation and inclusion of new plants in the portfolio

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