



**Industrial Potential Management On The Basis Of An Engineering And Manufacturing Chain**

**Elvira G. Nikiforova<sup>1</sup>, Aida A. Safina<sup>2</sup>, Almaz A. Murtazin<sup>3</sup>**

**1. Department of General Management, the Institute of Management, Economics and Finance at Kazan Federal University, Aelvir4ik@yandex. ru**

**2. Department of General Management, the Institute of Management, Economics and Finance at Kazan Federal University, mitchl@mail. ru**

**3. Department of Social and Educational Work, the Institute of Management, Economics and Finance at Kazan Federal University, murtazin-almaz@yandex. ru**

**ABSTRACT**

Neoclassical, institutional and planned approaches to the formation and activation of industrial potential are considered. A synthetic approach is proposed that integrates the main elements of neoclassical, institutional and planning directions to the formation and realization of industrial potential on the basis of engineering and manufacturing chains. It is substantiated that the most significant strategic direction of development of a engineering and manufacturing chain should be the formation of its fifth level, namely, high-tech processing of plastics. For the production of plastic products for both consumer and industrial use, the potential demand for which is quite substantial in the economy of the Republic of Tatarstan, high capital intensive production is not required. Accordingly, this niche may well be filled by small and medium-sized enterprises cooperating with enterprises of the third and fourth levels of the engineering and manufacturing chain belonging to the oil and gas chemical complex. The measures on state assistance in the formation of a system of small and medium-sized business entities are considered, and further development of the industrial potential of the oil and gas chemical complex in the Republic of Tatarstan based on the development of engineering and manufacturing chains is expedient to make more active use of public and private interaction. The proposed mechanism of public and private interaction assumes that the state (represented by regional authorities) gratuitously receives a certain additional minority stake in the capital of enterprises participating in the engineering and manufacturing chain of the oil and gas chemical complex in the exchange for the obligation of price compensation.

**Key words:** industrial potential, industrial and technological chain, public and private interaction, processing of plastics.



## **1. INTRODUCTION**

The potential demand for affordable and qualitative plastic products in the republican economy is quite wide. First of all, this kind of demand can be formed on the basis of import substitution of consumer goods manufactured: plastic dishes, plastic furniture for households and catering and service organizations, manufacturing toys, etc. In particular, now in the public catering industry there is a steady tendency to use plastic utensils characterized by more convenient consumer properties. In the long term, it is very likely that all institutions of the education and healthcare systems of the Republic of Tatarstan will transfer to the use of such dishes. Accordingly, the potential market for such products is quite significant, and it is important that it be filled by republican producers from the standpoint of ensuring high efficiency of regional socio-economic development (Program for the development and placement of the productive forces in the Republic of Tatarstan based on the cluster approach until 2020 and for the future until 2030 // [www.mep.tatar.ru](http://www.mep.tatar.ru)).

As shown in Table 1, the most significant strategic direction of the development of engineering and manufacturing chains should be the formation of its fifth level, namely, high-tech processing of plastics. High-tech processing of plastics is a relatively low-cost creation of a wide range of high quality plastic products, both technological and aesthetic.

**Table 1 .The proposed synthetic approach to the activation of the process of realizing the industrial potential based on the development of an engineering and manufacturing chain in the oil and gas chemical complex of the Republic**

Elements of the synthetic approach	Main Activities
1. Neoclassical approach.	<ul style="list-style-type: none"><li>- integration of free market mechanisms in the oil and gas chemical complex and public and private interaction tools;</li><li>- state guarantees for large project loans for the development of the chain;</li><li>- the mechanism of entering into the capital of enterprises participating in the chain in exchange for state guarantees of compensation for a part</li></ul>



	of the loss of profit as a result of possible fluctuations in national and world markets.
2. Institutional approach.	<ul style="list-style-type: none"><li>- further development of the institution of providing and protecting property rights for the means and results of production;</li><li>- formation of an institution for preventing and resolving the conflict of interests of enterprises participating in the chain;</li><li>- Improvement of the infrastructure ensuring efficient operation of the engineering and manufacturing chain.</li></ul>
3. Planned approach.	<ul style="list-style-type: none"><li>- Planning the creation of a new level of the engineering and manufacturing chain (high-technology processing of plastics) and the implementation of planned activities;</li><li>- Indicative planning of the parameters for development of the engineering and manufacturing chain (investment, financial, investment, labor, etc. );</li><li>- Planning for the introduction of uniform management standards, tools for industrial and technological policy in enterprises entering into different levels of the chain</li></ul>

Plastics are also actively used in the toy production industry. This type of production occupies a certain niche in the economy of many countries of the world, and, in general, the toy production industry is quite profitable.

Another direction of ensuring demand for products of the potential fifth level enterprises from the engineering and manufacturing chain is their industrial use, particularly in the production of vehicles, medical equipment, etc. In this regard, the creation of small and medium-sized enterprises of the fifth level of the engineering and manufacturing chain, cooperated with OJSC "Kamaz", industrial enterprises of the SEZ "Alabuga" and others seems to be relevant. In general, the task of maximally providing the republican industry with plastics of various profiles of own Tatarstan production should become one of the priorities of the regional industrial policy.

In general, the production of plastic products, both consumer and industrial purpose, does not require extremely high capital investments. Accordingly, this niche may well be filled by small and medium-sized business entities cooperating with enterprises of



the third and fourth levels of the engineering and manufacturing chain operating in the oil and gas chemical complex (alternatively, even created with them as subsidiary structures).

The economic efficiency of such enterprises can be achieved by reducing transportation costs for both the supply of raw materials and the transportation of finished products to end users, and also as a result of optimal operation of the warehouse economy, because close vertical industrial cooperation provides for a clear coordinating the timing of the materials supply and shipment of finished products, up to work according to the "JIT" system (precisely-in time) characterized by minimization of warehouse costs (Methodological recommendations on the implementation of cluster policy in the subjects of the Russian Federation // Letter of the Russia's Ministry of Economic Development and Trade Russian Federation dated December 26, 2008. No. 20615-AK / D19). In addition, a significant factor in the potential competitiveness of the production of plastic products is the ability to clearly harmonize product quality, to implement a joint assortment policy, co-finance research and development in the field of economics and technology for the production of plastic products.

It is expedient to make more active use of public and private interaction for further build up the industrial potential of the oil and gas chemical complex in the Republic of Tatarstan based on the development of engineering and manufacturing chains.

## **2. METHODS**

We propose a version of the public and private interaction mechanism which stimulates the progressive development of the engineering and manufacturing chain in the oil and gas chemical complex. One of the strategic problems on formation and development of engineering and manufacturing chains in this segment of the economy is a possible disparity of economic interests caused by the disproportionate distribution of profits between enterprises which are elements of the chain. On the other hand, in case of significant price fluctuations in the world market, some enterprises may lose incentives for further industrial cooperation within the oil and gas chemical complex.

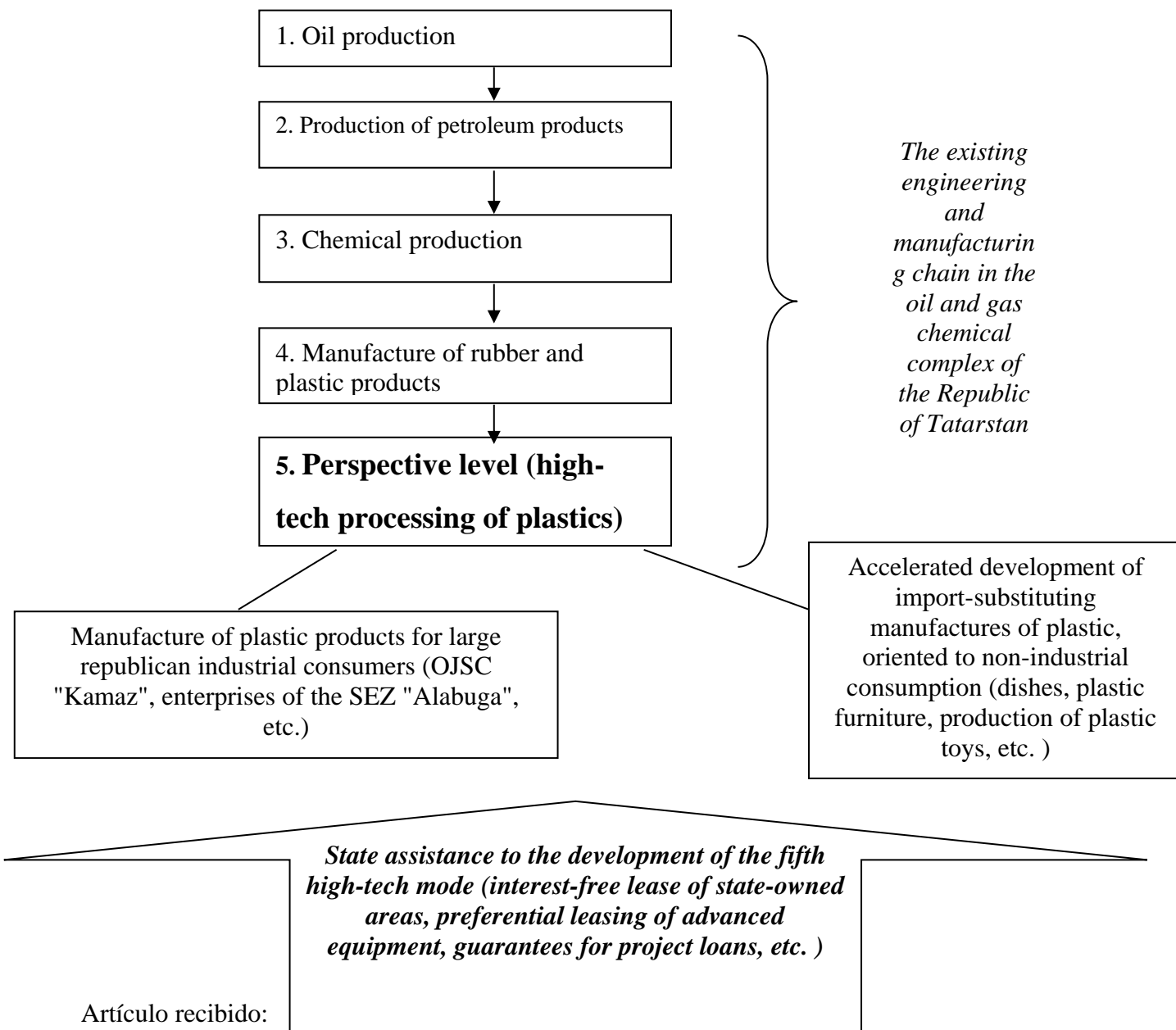
For example, let's suppose that the price of a barrel of oil in the world market has extremely increased. Under these conditions, it is obviously that for more profitable OJSC "Tatneft", it would more profitable to sell oil at favorable export prices, rather than deliver it to the subsequent elements of the engineering and manufacturing chain at



substantially lower prices. On the other hand, enterprises that are part of higher levels of the engineering and manufacturing chain (oil refining and chemical industries) will not be able to purchase oil and oil products at world market prices. Obviously, a mechanism is needed to prevent this kind of conflict of interests, taking into account the needs of the progressive social and economic development in the Republic of Tatarstan as a whole (acceptable level of prices for refined products for the population and organizations, primarily gasoline, affordable prices for plastic products, etc.).

### 3. RESULTS

Figure 1 shows the measures proposed for state assistance in the formation of a system of small and medium-sized businesses, which constitute a promising fifth level of the engineering and manufacturing chain.





**Fig. 1. - Directions of development of the engineering and manufacturing chain related to the fifth level (high-technology processing of plastics) in the Republic of Tatarstan (Berzon N. 2009)**

Thus, in the Republic of Tatarstan, there are the following programs for state assistance in the formation of a system of small and medium-sized businesses:

- provision for long-term lease, free of charge or for a nominal fee, of areas that are of state or municipal property, for enterprises which core activities are high-technology production of plastic products based on cooperation with enterprises of the engineering and manufacturing chain of the fourth level in the oil and gas chemical complex of the Republic of Tatarstan;
- Assistance in purchasing advanced high-performance equipment for leasing with preferential terms (for example, through the "Small Business Leasing Company of the Republic of Tatarstan" or the Investment and Venture Fund of the Republic of Tatarstan);
- State guarantees for long-term investment project loans of commercial banks;
- The program on stimulation of crediting the small and average business subjects (the interest rate - 11% for small business subjects and 10% - for subjects of medium-sized business);
- Administrative mechanisms (for example, the requirement for retail chains engaged in trade with products made from plastic to ensure for the republican producers at least a certain percentage of the total turnover with regard to this type of products, provided they are of high quality and fully comply with all established standards);
- Granting access of small and medium business entities to procurement along with the terms of the largest companies;
- Support for exports, assistance in expanding foreign economic cooperation of small and medium-sized enterprises of the Republic of Tatarstan.

We propose the mechanism for public and private interaction, which should include the following main stages:



1. The state (represented by regional authorities) gratuitously receives a certain additional minority stake in the capital of enterprises participating in the engineering and manufacturing chain of the oil and gas chemical complex in exchange for the price compensation obligation.

2. The price compensation obligation is that if, as a result of the influence of external factors (for example, fluctuations in world prices in the relevant industrial markets), the state compensates the participating enterprise the part of the potential loss from the latter will supply the agreed amount of products.

For example, if the contract between the enterprises of the first and second levels of the engineering and manufacturing chain from the oil and gas chemical complex (an oil production and refining enterprise) indicates that the maximum price for the supply of crude oil within the chain is \$ 130 per barrel, and the actual price of oil in the world energy market was \$ 160 per barrel, the state (for example, by creating a special extrabudgetary compensation fund or a sub-fund within the framework of the current Venture Investment Fund) will compensate the enterprise for oil production the part (for example, 30-40%) of the lost profit (\$ 30 per barrel) within the oil delivery in frameworks of the chain within a certain period.

3. The state will receive dividends on the shares (received as a result of this mechanism) issued by the oil and gas chemical complex of the Republic of Tatarstan.

Thus, if the price of the products (which are, respectively, the raw material for the other elements of the chain) of enterprises being components of the chain, will fluctuate within the normative level, then the state, without losing anything financially, will receive additional income in the form of dividends. In the same case, if there is a significant price fluctuation, the state compensates a part of the lost profit to the enterprises that are part of the engineering and manufacturing chain, which will in some way smooth out the potential conflict of interests and increase incentives for further cooperation of enterprises within the chain.

In any case, despite possible losses for the state budget (which can be minimized through rational planning and forecasting of fluctuations in world prices and the corresponding establishment of rational limits from fluctuations within the engineering and manufacturing chains of the oil and gas chemical complex), the proposed mechanism is more rational in comparison with the transfer mechanism pricing, which





was used in many Russian Vertically Integrated Oil Companies in 2000 and not only was non-market in nature, but also allowed a number of enterprises being Vertically Integrated Oil Companies quite illegitimately evade the payment of profit tax. The proposed mechanism of the obligation on compensation for a part of the lost profit does not contradict the federal economic and tax legislation.

Of fundamental importance is the institutional aspect of the synthetic approach proposed by the author to the formation of industrial potential based on engineering and manufacturing chains. Indeed, if effective institutions that ensure the progressive development of economic relations between the levels of the engineering and manufacturing chain are not formed, its progressive development is problematic in the long run.

So, for example, in conditions of undeveloped institution on providing and protecting the rights and legitimate interests of property, the formation of long-term stable relations within the engineering and manufacturing chain is problematic. Indeed, if there are corporate conflicts within one of the enterprises participating in the chain or, for example, there is an unfriendly takeover process, the development of cooperative relations with this kind of business entity is very risky. Moreover, such risks are connected not only with the fact that a new owner can radically change the policy with respect to industrial integration and cooperation, but also with the fact that the accounts of the organization can be blocked within the corporate conflict process, which will negatively affect the volume and timing fulfillment of its obligations to other participants in the engineering and manufacturing chain and, ultimately, to realize the industrial potential of the cluster as a whole.

Similarly, for example, the inefficiency or even the apparent corruption of the arbitration court institution is a deterrent to the formation of long-term contractual economic relations that constitute the legal basis for the operation of an engineering and manufacturing chain. (Ignatovsky P.2009).

Accordingly, the development of institutions is an indispensable element in the formation of long-term sustainable relations between enterprises within an engineering and manufacturing chain and the fullest implementation of their industrial potential on this basis. In addition, an effective system of institutions will allow reducing the level of transaction costs of enterprises entering an engineering and manufacturing chain, and,





thus, other things being equal, will increase the level of competitiveness of their products (Dormidontov A. V. 2011).

In addition to the traditional institutions of a market economy (institution for the protection of property rights, the corporate governance institution, the arbitration court institution, etc.), it is proposed to create in the republican economy a special institution for preventing and resolving conflicts of interests between enterprises participating in the chain. This institution should be established at the level of the Government of the Republic of Tatarstan, with the involvement of the scientific community, and industry specialists. Potential conflicts between participants in the chain on issues of price, technical and investment policy and other issues should, within the framework of this institution, be as open and transparent as possible: when developing options for their resolution, mandatory consideration should be given to the goals and priorities of the social and economic development of the Republic of Tatarstan as a whole.

#### **4. CONCLUSIONS**

A synthetic approach to the formation and realization of industrial potential based on engineering and manufacturing chains which integrate the basic elements of the neoclassical, institutional and planned approaches has been developed. The main activities within the framework of the proposed approach are: integration of free market mechanisms into the oil and gas chemical complex and public private partnership tools; state guarantees for large project loans for the development of the chain; the mechanism of entering into the capital of enterprises participating in the chains subject to exchange for state guarantees of compensation for a part of the loss of profit as a result of possible fluctuations in national and world markets; further development of the institution on providing and protecting property rights to the means and results of production; formation of the institution for prevention and resolution of conflicts of interest between enterprises participating in the chain; improvement of the infrastructure ensuring efficient operation of engineering and manufacturing chains; indicative planning of the development parameters for engineering and manufacturing chains (investment, financial, labor, etc.); planning the introduction of unified management standards and tools of engineering and manufacturing policy in enterprises entering into different levels of the chains.



It is substantiated that the most significant strategic direction of development of engineering and manufacturing chains should be the formation of its fifth level, namely, high-tech processing of plastics. An important factor in the potential competitiveness of the production of plastic products is also the possibility of a clear harmonization of product quality, the implementation of a joint assortment policy, co-financing of R & D works in the field of economics and technologies for production of plastic products.

#### **5. ACKNOWLEDGMENTS**

The work was carried out with the help of the Russian state program on improvement of the competitiveness of the Kazan Federal University. We are grateful to Director of the Institute of Management of Economics and Finance, Nail Gumerovna Bagautdinova, and the Deputy Director for Scientific Activities, Lenar Nailevich Safiullin

#### **6. REFERENCES**

- Berzon N. 2009. Formation of production cycles in the economy / N. Berzon // Economics. No. 7. - P. 104- 107.
- Dormidontov A. V. 2011. Problems of the formation of engineering and manufacturing chains in Russia / A. V. Dormidontov // Vestnik of the International Republic Institute. №3. - pages 15-17
- Ignatovsky P.2009. Labor productivity in the oil and gas chemical complex: measurement problems // Economics and Law. No. 11. - P. 3 - 8.
- Methodological recommendations on the implementation of cluster policy in the subjects of the Russian Federation // Letter of the Russia's Ministry of Economic Development and Trade Russian Federation dated December 26, 2008. No. 20615-AK / D19
- Program for the development and placement of the productive forces in the Republic of Tatarstan based on the cluster approach until 2020 and for the future until 2030 // [www.mep.tatar.ru](http://www.mep.tatar.ru)