

# Impact of Business Planning for Mini Oil Refineries to Enhance Socio-Economic Landscape

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**ABSTRACT:** This article develops a comprehensive business plan for establishing a mini-oil refinery in a Russian Federation territory currently lacking refining capacity. Recognizing the critical need for localized oil processing due to a regional monopoly and the high demand for petroleum products, this study aims to provide a strategic blueprint for potential investors and local authorities. A mixed-methods research design is utilized, combining a systematic literature review of existing business plan frameworks with quantitative data analysis to assess market demand and financial feasibility. The methodologies from UNIDO, EBRD, and TACIS are evaluated for their relevance to the Russian economic and regulatory environment, with UNIDO's framework identified as the most suitable due to its adaptability and comprehensive nature. The findings suggest that implementing a mini-oil refinery is financially viable and aligns with Russian industrial standards. The localized refining capacity significantly enhances regional economic resilience and sustainability by reducing costs, increasing market competition, and creating job opportunities. This study emphasizes the practical significance of the strategic plan, which ensures that effective and efficient operational activities align with the unique demands of the identified territory. This research contributes to the field by offering a practical solution to regional oil refining disparities, promoting economic development, and providing a model for similar contexts. The study's comprehensive approach and detailed analysis offer valuable insights for policymakers, business planners, and investors in the oil refining industry.

**Keywords:** Mini-Refinery Investment, Strategic Planning in the Oil Sector, Energy Policy, Regional Economic Development, Industrial Feasibility Analysis.

## I. INTRODUCTION

In the complex and dynamic landscape of business, the formulation of a business plan is recognized as a critical foundational step for successful venture creation and management [1]. This strategic document is important not only for delineating a venture's financial objectives and operational strategies but also for providing a structured mechanism for navigating market complexities and competitive environments [2].

Considering the current development of the market economy in Russia, business planning is one of the most important prerequisites for optimal production management [3]. However, certain territories within the Russian Federation face significant challenges due to the lack of localized oil refining capacity. This deficiency creates a regional monopoly, leading to increased transportation costs, higher prices for consumers, economic inefficiencies, and a lack of economic resilience.

In the identified territory, the absence of a local oil refinery means that crude oil must be transported to distant facilities for processing. This not only raises costs but also diminishes the economic potential of the region. The high demand for petroleum products, coupled with the monopolistic control of refining capacities by a few entities, exacerbates the situation.

To address this issue, business planning should be considered a mechanism for management function integration to create a strategically managed enterprise, which, in turn, requires close coordination between strategic and operational planning. In this regard, the hypothesis of our study is the following: Implementing a mini-oil refinery in a specific territory of the Russian Federation, currently lacking local refining capacity, will significantly enhance regional economic resilience and sustainability. A business plan is one of the key elements of business planning. Table 1 presents different points of view at the “business plan” term.

**Table 1.** Business plan term review

Authors	Definitions
[4, 5]	Conceptual document applied for internal company planning, feasible justification of the project funding, and for the purpose of external investments attraction. In two aspects:
[6]	1. Result of the consolidated planning of the company’s activities that is carried out systematically and on a regular basis. 2. Result of occasional planning carried out within the framework of a certain project to solve a specific strategic problem.
[7]	Result of a comprehensive study of various aspects of the company’s activities (production, product sales, after-sales service, etc.).
[8]	Comprehensive document that reflects the most important aspects and indicators, which provide an overall and holistic view of the future or emerging venture. It is a plan for the sound organization of a specific business.
[9]	Generally, accepted world economic practice for presenting business proposal or a project, that contains detailed information about the production, sales, financial activities of the company and assessment of the prospects, conditions and forms of cooperation based on the sense of balance between the company’s business interests and the interests of partners, investors, consumers and competitors, prospects, forms and conditions of cooperation.

Source: Compiled by the authors

Based on the analysis of different interpretations of the “business plan” concept, it is possible to formulate the author’s definition “Business plan is a form of presentation of business ideas and projects, assessment of efficiency and reliability of investments and prospects that reflect economic interest of the company and the interests of partners, investors, consumers and competitors”.

The objective of this study is to consider a project for a small oil refinery in the particular identified territory of the Russian Federation [10]. This identified territory demonstrates the lack of oil refining capacity, so the project is certainly motivating and in demand. In the Russian Federation, the state has a monopoly on oil refining, but this does not mean that it is impossible for a private enterprise to succeed in this sector. Within the volatile and competitive domain of business, especially in sectors that are capital intensive and regulated by oil refining, the meticulous development of a business plan is not optional but rather a prerequisite for viability and growth [11].

Due to the constant demand for petroleum products used in shipping (fuel oil), city boiler houses (fuel oil, heating oil), agriculture (fuel oil, diesel fuel), and gas stations (retail sale of gasoline), there is a high probability

for a new enterprise to take a stable position in the market. A mini-plant is more profitable than a large one since the government agencies do not consider it to be a strong competitor. As a rule, enterprises of such a scale appear at sites where oil production volumes are small; therefore, the construction of large-scale production is not economically reasonable.

The provision of oil refining services to small producers in the identified territory is possible, especially for those producing two to five tons of product per month. This is not an excise production, but it has its right to say since there are several similar producers in the region carrying out additional exploration and development of previously mothballed oil fields engaged in oil production and supply of petroleum products [12, 13].

Every entrepreneur strives for the successful development of the business. Stable business development depends on full awareness of future prospects and possible risks. Therefore, it is necessary to plan business activities, efficiently utilize available resources, mobilize reliable sources and stay competent in cost policies for the production and economic activities of the enterprise. Business success is based on three components:

- constant source of oil;
- convenient logistics;
- established sales of finished products.

Therefore, the main goal of such enterprises is to develop production capacities by means of the invention of a new generation enterprise for deep oil refining that can serve the demands of the market. Market needs can be met due to the economic effect achieved by the net income of the enterprise and taxes to the federal and regional budgets.

This strategic intent is operationalized through a series of specific tasks that the enterprise aims to accomplish:

- production and trade of high-quality petrochemical products and services;
- advancing new and expansion of existing sales markets;
- production of motor gasolines A-92, A-95, and A-98;
- production of diesel fuel.

The tasks outlined represent a strategic operational framework designed to establish the enterprise as a key competitor within the oil refining industry; they collectively contribute to achieving the broader goal of enhancing production capacities and economic contributions. This dual focus not only aligns with the enterprise's growth objectives but also underscores its commitment to meeting market demands through innovative and economically beneficial strategies.

Despite the clear strategic operational framework and objectives set forth for establishing the enterprise as a formidable entity within the oil refining industry, the venture faces inherent challenges that necessitate a comprehensive investigation and formulation of a robust plan. The current situation reveals a significant gap in the specific territory's oil refining capacities, alongside a lack of detailed strategic and operational blueprints tailored to the unique demands and opportunities within the Russian Federation's oil and gas sector.

Therefore, the purpose of this study was to develop a draft business plan for mini-oil refineries. By that business plan for mini-oil refineries would serve to consolidate and expand theoretical knowledge and acquire practical skills in planning operational activities for oil and gas enterprises. In terms of the purpose of the study, the following research questions are considered:

- How can a mini-oil refinery address the lack of local refining capacity and its associated socio-economic issues?
- What are the financial viability and projected returns on investment for a mini-oil refinery in the identified territory?
- Which business planning frameworks (UNIDO, EBRD, TACIS) are most suitable for the Russian economic and regulatory environment?
- What are the specific operational and strategic tasks needed to establish a mini-oil refinery successfully?

## II. MATERIALS AND METHODS

### 1. RESEARCH DESIGN

Based on the research problems and study purpose, the authors have followed a systematic research framework (Figure 1)

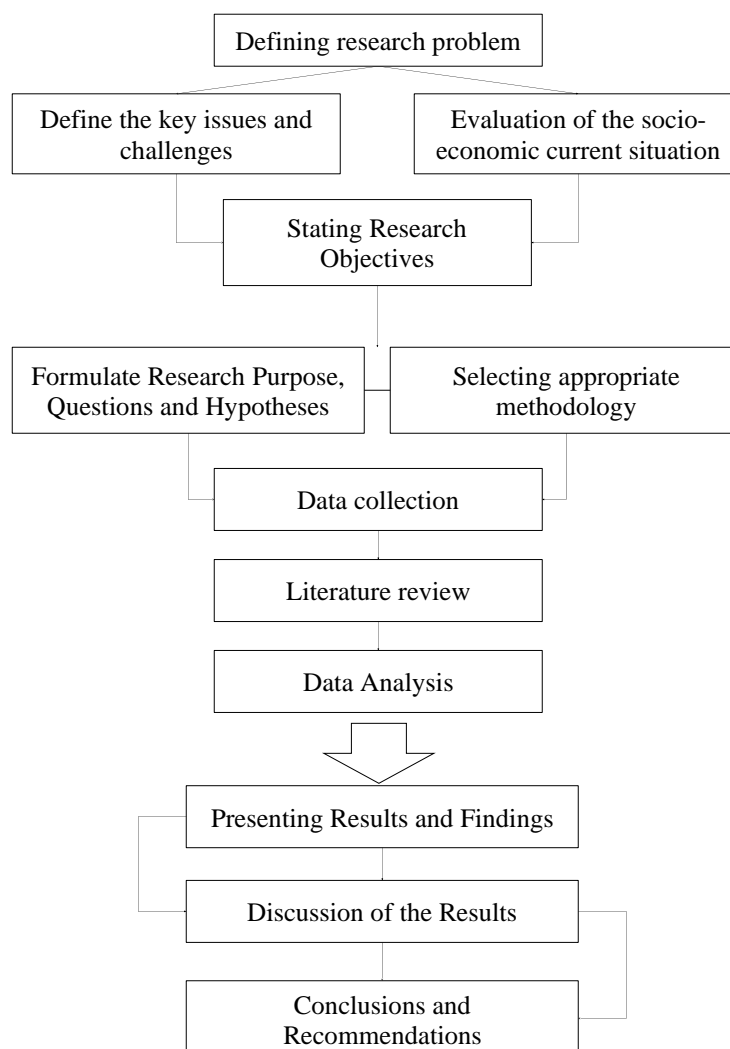


FIGURE 1. Research framework

This study employs a mixed-methods approach combining qualitative and quantitative research to ensure an effective analysis of the proposed business plan.

This paper provides a systematic review of the literature on business plan development, focusing on methodologies adopted within the oil refining industry and their applicability to the Russian market.

Comparative analysis was performed by evaluating different business planning frameworks by UNIDO, EBRD, and TACIS, determining their relevance and customization to the local regulatory and economic context. The selection of UNIDO (United Nations Industrial Development Organization), EBRD (European Bank for Reconstruction and Development), and TACIS (Technical Assistance to the Commonwealth of Independent States) methodologies was guided by several criteria including Relevance to Local Economic Conditions, Regulatory Compatibility and Strategic Assistance. UNIDO's methodology is known for its adaptability and

comprehensive approach to industrial development, making it suitable for Russia's evolving market conditions. EBRD's focus on development in transitional economies aligns with Russia's current economic reforms, and TACIS provides crucial support for CIS countries adapting to market economies. This combination ensures business plan compliant with local regulations, and positioned for sustainable success.

The scientific approach to business plan development emphasizes its role as a comprehensive strategic planning tool that supports decision-making, operational efficiency, financial management, and stakeholder communication. It is fundamental not only to the initial stages of business development but also to the ongoing management and strategic adaptation of the enterprise. As such, a well-conceived business plan is indispensable for navigating the complexities of the modern business ecosystem and achieving sustained organizational success.

## 2. DATA COLLECTION

Data collection was conducted using Scopus and Web of Science databases. Keywords such as "business plan frameworks," "oil refining industry," "Russian market," "UNIDO," "EBRD," and "TACIS" were used to search for peer-reviewed articles, industry reports, and existing business plans. The selection criteria for the literature included relevance to the oil refining industry and applicability to the Russian economic context.

The structure of a business plan is not regulated by law; therefore, this document can be prepared in any form, depending on the goal. However, a number of recommendations guide the business planning process:

- Methodological recommendations for assessing the efficiency of investment projects [14];
- TACIS (Technical Assistance for the Commonwealth of Independent States) – the European Union program to support the acceleration of economic reform processes in the CIS [15]
- EBRD (European Bank for Reconstruction and Development) – European Bank for Reconstruction and Development program [16];
- UNIDO (United Nations Industrial Development Organization) – United Nations Industrial Development Organization program [17];
- Recommendations of the Federal Fund for Support of Small Business [18];
- Decree of the Government of the Russian Federation No. 1470 [19].
- The business plan was structured according to the UNIDO guidelines, which are widely recognized for their comprehensive nature and adaptability to various industrial sectors, including oil refining, as presented in Table 2.

**Table 2.** Structure of a business plan in accordance with the requirements of UNIDO, EBRD и TACIS.

NO	UNIDO	EBRD	TACIS
1	2	3	4
1	Title page	Title page	Title page
2	Project summary	Memorandum of Confidentiality	Summary: name of the company, its type; generation of capital; brief summary of the project; date of the enterprise opening; objectives of the enterprise; review of financial needs
3	Project description: – idea (essence) of the proposal; – general initial data and conditions; – description of a new product sample.	Project summary	Company's goals: – subjective goals; – production goals, that include: – minimum income during the first operational year; – capital turnover for a specific period of time; – leadership in a certain business area;

			– introduction of completely new range of goods or services in the market; –market share x, %
4	Market analysis: – assessment of the sales market; – description of the new product consumers; – assessment of product competitiveness	Company summary: – history of the company, its development and its current activities; – information about the owners and personnel of the company; – financial status; – loans	Management: – structure of the management team; – education, training, relevant experience; – current responsibilities; – proposed responsibilities; – additional management skills
5	Marketing plan: – marketing goal; – marketing strategy; – financial support	Project: – general information; – investment plan; – market analysis, competitiveness; – description of the production process; – financing; – environmental compliance	Market analysis: – market volume; – growth or contraction trends; – competitors, their advantages, disadvantages
6	Production plan: – production of a new product; – production capacity; – material factors of production; – description of the production process	Financial plan: – timetables for receiving and repaying loan funds; – material and technical grounds and the list of works financed from loan funds; – SWOT analysis; – risks and their reduction measures	Products: – compliance with customer needs; – cost calculation; – volume of warehouse stocks; – produce turnover in the warehouse; – delivery requirements and needs met; – impact of uncompleted works on business
7	Administrative plan: – type of organization and legal form; – organizational structure; – distribution of duties; – information about partners; – description of the external environment – labor resources; – information about members of the management team	Appendixes	Pricing: – price calculation; – price range; – comparison of prices within the industry; – threshold of self-sufficiency, profitability
8	Financial plan: – income and expenses summary;	–	Suppliers: – names of companies, addresses, reliability; – alternative sources;

		<ul style="list-style-type: none"> <li>– assessment of the cash flow;</li> <li>– consolidated balance sheet;</li> <li>– break-even analysis;</li> <li>– financing strategy (sources of funds and their use);</li> <li>– risk assessment;</li> <li>– insurance</li> </ul>	<ul style="list-style-type: none"> <li>– procedures for quality warranty</li> </ul>
9	Appendixes	–	Material grounds: <ul style="list-style-type: none"> <li>– expected period of safe equipment operation;</li> <li>– office equipment needs;</li> <li>– transport needs;</li> <li>– sources of financing</li> </ul> Premises: <ul style="list-style-type: none"> <li>– location of production premises;</li> <li>– rental terms;</li> <li>– renovation of premises</li> </ul> Personnel: <ul style="list-style-type: none"> <li>– categories of personnel;</li> <li>– acceptance terms</li> </ul> Profit and prospects: <ul style="list-style-type: none"> <li>– cash flow forecast;</li> <li>– costs estimation;</li> <li>– main components of risk;</li> <li>– calculations of the break-even point;</li> <li>– sales forecast</li> </ul> Requirements for finance: <ul style="list-style-type: none"> <li>– own investment sources;</li> <li>– contributions in the form of fixed and current funds;</li> <li>– outsource investments</li> </ul>
10	–	–	
11	–	–	
12	–	–	
13			

Source: Compiled by the authors

### 3. DATA ANALYSIS

It is important to note that the main goal of entrepreneurial activity is profit generation. The main motivation for running any type of business and its ultimate goal is to increase the well-being of the owners of the enterprise. This profit increase characteristic is the amount of current and deferred income of the invested capital, the source of which is the received profit.

The profit of the enterprise presents a rough picture of the efficient performance of a business. Profitability provides a more accurate assessment. Profitability is the indicator that represents the ratio between the profit and the amount of production costs, monetary investments in commercial operations or the amount of property, which is noted in the business project [20]. Product profitability is calculated with Equation 1:

$$R_{pr} = BP/Seb \times 100 \quad (1)$$

Where *Seb* produce cost for sold products in thousand rubles; *BP* balance sheet profit in thousand rubles. Production profitability is calculated with Equation 2:



$$R_p = NP/Seb \times 100 \quad (2)$$

Where *NP* is the net profit in thousand rubles; *Seb* produce costs for sold products in thousand rubles.

The return on turnover is calculated with Equation 3:

$$R_{rev} = NP/Rev \times 100 \quad (3)$$

Where *NP* net profit in thousand rubles; *Rev* revenue from product sales in thousand rubles.

### III. RESULTS

A comparison of business plan structures developed by UNIDO, EBRD and TACIS shows that the structure proposed by EBRD is the most concise and still comprehensive. At the same time, attention is given to the activities of existing enterprises, and the possibility of developing directives for the improvement of active companies arises. The structure of the business plan proposed by the TACIS, in the opinion of the authors, is overly ramified and does not meet the needs of Russian investors. The most appropriate for Russian conditions is the business plan structure according to UNIDO, which is also applied in domestic software that reduces the amount of work for business plan developers. In addition, the UNIDO structure can be logically integrated into the sequence of works related to the development of investment business plans when information technologies are applied as appropriate tools (Table 3).

**Table 3.** Compliance of the business plan creation process with its structure and modern information technologies.

Stages of the business planning process	Business plan section	Final calculations with information technologies
Collection and analysis of information on goods and services (description of goods, services)	Section 3	–
Collection and analysis of information on the sales market (marketing and sales of goods and services)	Section 4	–
Analysis of the company and its capabilities and industry prospects (description of the companies working in the same business)	Section 2	–
Description of needs and provision of premises, equipment, personnel and other resources (production plan)	Section 5	–
Calculation of requirements for capital and sources of financing (financial plan)	Section 7	Income statement. Cash flow statement Forecast balance
Trends and scale of projects, efficiency calculation (trends and efficiency of projects)	Section 7, 8	Accrued taxes. Financial results. PP, PI, IRR, NPV
Development of legal support means and project's implementation schedule (organizational plan)	Section 6	–
Risks elimination and guarantees (risks and guarantees)	Section 7	Sensitivity analysis
Selection of materials and preparation of applications	Applications	Graphs
Summary of the project (resume)	Section 1	–

Source: Compiled by the authors



The study of Russian methodologies for the development of business plans revealed that UNIDO requirements are most fully enfolded into those for preparing proposals for potential investors. Building upon this, our financial analysis will apply these methodologies to align with local and international investment criteria.

*Return on Investment (ROI)*: ROI is typically calculated by dividing the net benefits of the project by its total costs. This indicator will aid in understanding the efficiency of the investment relative to its costs. For the mini-oil refinery, ROI will be meticulously projected based on expected annual returns from the sale of refined products minus operational and setup costs over the investment horizon.

*Payback Period*: This metric estimates the time needed to recoup the initial investment from the refinery's cash flows, directly reflecting the project's risk and liquidity.

*Net Present Value (NPV)*: By discounting future cash flows to their present value and subtracting the initial costs, the NPV will be determined to evaluate the project's profitability and justify the investment given current market conditions.

*Internal Rate of Return (IRR)*: The IRR for the project is computed to identify the discount rate that makes the NPV of all cash flows zero. It will identify the project's expected annualized return rate, comparing it to alternative investments.

A sensitivity analysis will also be important to assess the impact of key economic variables like oil price fluctuations and market demand on these financial indicators, thus providing insights into potential financial risks and opportunities.

However, there are guidelines developed for small businesses that apply for financing. Methodological recommendations are developed by the Federal Fund for Support of Small Businesses (FFSMP). Examining Russian methodological recommendations, the model of a business plan developed by the government of the Russian Federation should receive increased attention. This model is mainly submitted by the applicant as a part of the application form when applying for funds from the Development Budget of the Russian Federation. A comparison of the business plan structure developed in accordance with different Russian methodologies is provided below (Table 4).

**Table 4.** Business plan structure developed in accordance with different Russian methodologies.

# of the Section	Methodological guidelines on preparing proposals for submission to potential investors	Requirements to business plans and recommendations for their preparation, as per FFPMP	Business plan layout for inclusion into applications for funding from the Development Budget of the Russian Federation
1	2	3	4
1	Executive Summary	Overview section (summary)	Introduction or summary of the project
2	Company history and Ownership	Summary of the company	Analysis of the business sector
3	Products and/or Services	Description of goods (services)	Production plan
4	Management and Labour	Market analysis	Marketing plan
5	Industry, Market and Competitive performance	Production plan	Organization plan
6	Company's operations	Sales plan	Financial plan
7	Financial history	Financial plan	–
8	Strategic plan	Project sensitivity analysis	–
9	Risks and Risk reduction Strategies	Ecology and reference data	–
10	Financial forecasts	Appendixes	–
11	Summary of Financing requirements	–	–
12	Corporative management	–	–
13	Government support and Regulations	–	–
14	Financial proposal	–	–

15	Summary	–	–
16	Appendixes	–	–

Source: Compiled by the authors

Comparing business plan structures developed in accordance with Russian methodologies, it is noted that the structure submitted by the applicant as part of the application form for financing from the Development Budget of the Russian Federation is the most concise. The requirements and recommendations for business plans developed by the FFPMP are classified for small businesses. Methodological recommendations on proposals for potential investors are quite extensive. In the authors' opinion, the most advantageous business plan structure is the one included in the application form for funding from the Development Budget of the Russian Federation.

Therefore, the selection of one or the other business plan structure fully depends on the goals of its developer.

The basic methodology for developing a business plan for the oil refining business is that of the UNIDO. It acts as a universal database and a kind of universal language that allows investment planning specialists, financial analysts, and company managers from around the world to communicate with each other. The UNIDO standard developed more than 30 years ago ensures the collection of all the necessary information to develop a high-quality business plan. Its advantage is underlined with the most structured and detailed model for business plan development [21]. This approach is ideal for emerging entrepreneurs and is suitable for new oil refineries. Among the disadvantages are a lack of risk assessment and low adjustment to the Russian tax system.

It is important to note that the issues covered in each section of the UNIDO methodology for business plan development are typical and common for all projects since the methodology is optional but not mandatory. The developer of each individual business plan has the right to add some sections essential for his project or delete unimportant ones.

This research reviews projects for mini-oil refineries with a capacity of 500 thousand tons per year of crude oil.

The source of the raw materials is the oil fields of the key oil-producing enterprises in the identified territory and several small oil-producing companies. The supply of raw materials is carried out by means of their purchase from oil suppliers at domestic market prices.

The mini-oil refinery, as agreed upon by the municipal authorities of the identified territory, covers an area of more than 300 square meters in the identified municipality. This option is the most preferable since there is necessary engineering infrastructure in the territory, including a tank farm, security systems and utility. It is located near a railway line and an oil loading station. Municipality is transit for an oil wagon train passing to a neighboring region where oil is further transported abroad by the sea. The site is more than 3 km away from the nearest populated areas. The distance to the main consumer of petroleum products, which is the capital of the region, is 205 km. The site is entirely located in the steppe zone and does not consume arable land out of production. The plant is a set of basic petrol technological processes that consists of workshops, machinery, units, and auxiliary and maintenance services that ensure industrial enterprise functioning.

The territory of the mini-oil refinery is also equipped with storage facilities for raw materials and finished petroleum products, which reduces the volume of the investment plan for launching the project. It is important to note that few oil-producing companies already operate near the planned location of the plant, and those companies worked out provisions for the supply of raw materials earlier. All these factors favourably influence the financial plan of future oil refineries.

According to Dimurina [22], the organizational plan for a mini-oil refinery strategically considers several critical location factors to optimize operational efficiency and safety. These include:

1. Proximity to Consumer Markets: The site is chosen with close proximity to areas with high demand for oil products, ensuring ease of distribution and reduced transportation costs.
2. Product Demand: The location is selected based on the local market's demand for specific types of petroleum products, aligning production capabilities directly with consumer needs.

3. Accessibility: The site is accessible via major highways, facilitating the efficient transfer of raw materials to the refinery. This accessibility is complemented by other transportation routes, enhancing logistical operations.
4. Safety Considerations: The refinery is strategically placed at a minimum distance of 100 meters from public railways and 50 meters from public roads to mitigate the risks associated with explosives and fire hazards.
5. Community Distance: To further ensure safety and compliance with environmental standards, the refinery maintains a buffer zone, with the boundary of the site being at least 1000 meters away from any populated area.

Like any other enterprise, the mini-oil refinery has advantages and disadvantages. The business idea for primary oil refining highlights the advantages of a small oil refinery [23]:

- production flexibility;
- low costs for installation and transportation of equipment;
- small-scale staff (focus on complete automation of processes);
- reduced current and capital costs.

Disadvantages of production at mini oil refinery:

- expensive equipment;
- information on oil refining processes and preferably practical experience in this area;
- competitiveness, including the largest state corporations;
- hazardous production, potential damage to the environment.
- compliance with legal requirements in environmental protection, technology and safety;
- qualified personnel;
- high construction costs.

Kunitsyna & Dimurina [24] note that the identified territory's need for mini-oil refineries is subject to a number of reasons:

- the territory is a fairly large consumer of basic petroleum products;
- high costs for petroleum products outside the region and high transport costs due to their long-distance delivery by land transport from neighboring regions. In addition, release prices for petroleum products include taxes (value added tax, excise tax, income tax), which cause an outflow of funds from the region, aggravating the situation in the local economy;
- self-sufficiency of the territory in basic petroleum products by creating an oil refining plant means ousting external suppliers from the local market, which strengthens the energy independence of the region and improves regional and local budgets.

The favourable environment for mini-oil refineries in the identified territory includes the following:

- developed consumer market for petroleum products in the identified territory and adjacent regions;
- developed transport system (roads and railways);
- availability of land resources sufficient to allocate a site for the construction of a plant and laying an oil pipeline;
- availability of connections to the main oil pipeline;
- possibility of obtaining state funds for the provision of raw materials - oil.

Taking into account existing models for refineries, our proposed mini-oil refinery model distinguishes itself in several key areas that confer competitive advantages: *Localized Focus and Flexibility*: Unlike larger, more generalized models, our refinery is specifically designed to meet the unique demands of the local market. *Operational Agility*: Smaller scale operations allow for more agile decision-making and operational changes, which is crucial in responding to market volatilities. *Niche Market Expertise*: By targeting specific regional needs and customer segments, our refinery can offer specialized products and services that enhance customer satisfaction and loyalty, leading to potentially higher margins within these segments. *Faster Project Deployment and Scalability*: The smaller scale of the proposed mini-refinery allows for quicker construction and deployment, enabling faster market entry. These advantages underline the strategic positioning of the mini-refinery as not

just an alternative but a preferred choice in certain contexts where flexibility, cost efficiency, and community integration are key to successful operations.

#### IV. PRODUCTION AND TECHNOLOGICAL STRUCTURE OF THE ENTERPRISE.

The oil refining process at such enterprises is as follows:

- primary processing of raw materials;
- subsequent upgrade of oil fractions;
- production of flammable gas released during the refining process; several types of motor fuel and fuel oil.

To be constructed, mini-oil refineries appear to be large-scale consumers of raw materials, i.e., oil. Therefore, at the project planning stage, the issue of systematic provision of the enterprise with raw materials must be guaranteed. The most feasible option is to obtain state provision limits on raw materials according to the Decree of the Government of the Russian Federation. Other materials, such as catalysts for reforming, hydro cracking, hydro treatment, demulsifiers, and alkalis, are produced by enterprises in the Russian Federation and can be purchased as needed. The core infrastructure of a mini-oil refinery is composed of several critical pieces of equipment essential for its operation. This includes tanks for the storage of crude oil and finished products, specialized machinery for refining processes, and equipment designated for the loading and unloading of these materials. Additionally, the facility is equipped with a laboratory, which plays a crucial role in quality control and product testing. The refinery also features a boiler room that supports various heating and distillation processes and pumps specifically designed for the movement of petroleum products within the facility. Each component is integral to the overall functionality and efficiency of the refinery.

The issues of personnel and social development are of no less importance, which is reflected in the business plan of the oil refinery LLC Sosva Oil Refinery [25]. Mini oil refinery personnel can be divided into two groups:

1. Top management group and financial personnel (Table 5);
2. Production and support personnel (personnel for the start-up complex is recruited first, followed by personnel for the facilities and production units) (Table 6).

**Table 5.** Personnel list for the top management group and financial personnel of the full-capacity operating plant.

Job Titles	Number of personnel (in accordance with the staff list)
Director	1,00
Secretary	1,00
Chief engineer	1,00
Chief accountant	1,00
Bookkeeper	1,00
Economist accountant	1,00
HR Specialist	1,00
Sales Manager	2,00
Supply Specialist	2,00
Warehouse Manager	1,00
Head of Laboratory	1,00
Laboratory assistant	4,00
<b>Total</b>	<b>17,00</b>

Source: Created by the author Roshchupkina

**Table 6.** Personnel list for production and support personnel of the full-capacity operating plant.

Job Titles	Number of personnel (in accordance with the staff list)
Technologist	2,00
Machinery operator	5,00
Mechanic	2,00
Repairman	3,00
Electrician	2,25
Instrumentation and automation engineer	1,50
Boiler operator	2,25
Loader	3,00
Security guard	3,00
Cleaner	2,00
<b>Total</b>	<b>26,00</b>

Source: Created by the author Roshchupkina

It is intended to attract investments for the implementation of the project. The approximate amount of investments is difficult to determine, but average calculations show at least 200 million rubles. The final amount depends on a number of factors and, above all, on the scale of the project. Furthermore, Table 7 presents the financial results of the business.

**Table 7.** Financial results of the business.

Indicators	Indicators' values
Revenue in thousand rubles	5 377 922,71
Costs in thousand rubles	10 155 904,63
Balance sheet profit in thousand rubles	4 062 361,85
Taxes in thousand rubles	212 472,37
Net profit in thousand rubles	3 849 889,48
Product profitability, %	40,00
Production profitability, %	37,91
Profitability of turnover, %	71,59

Source: Created by the author Roshchupkina

The project is profitable. The calculated profit is 3,849,889.48 thousand rubles. The indicators are effective since the profitability of products is 40.00%, the profitability of production is 37.91% and the profitability of turnover is 71.59%.

## V. DISCUSSION

The most debatable issue related to business plans in the oil-refining complex is what investment costs are expected. The mining refinery's expenses plan is divided into two phases:

1. The calculation of the initial costs for the construction of an oil-refining complex is presented item by item in Table 8.

**Table 8.** Calculation of initial costs for opening a mini-oil refinery

Types of costs	Values in thousand rubles
registration of the enterprise	1000,00
purchase of land	124 050 000,00
construction works	95 628 000,00
installation work	144 118,41

accreditation	250,00
purchase of equipment	10 882 700,00
equipment installation	6 000,00
raw materials	11 049 620,00
advertisement	100,00
staff salaries during launch period	800,00
utility bills during launch period	100,00
<b>Total</b>	<b>241 762 688,41</b>

Source: Created by the author Roshchupkina

The calculations in Table 8 demonstrate that the initial cost of opening a mini-oil refinery will reach 241,762,688.41 thousand rubles.

2. Expenses plan after the launch of the enterprise After the enterprise is put into operation, the costs include material costs, personnel wages, social contributions, production costs, expenses for marketing activities, and sales and advertising of manufactured products. The calculations of the annual expenses are presented in Table 9.

**Table 9.** Calculations for the annual expenses

Types of expenses	Volume in thousand rubles	Costs structure, %
Depreciation deductions	28557,72	0,0547
General payroll	125424,26	0,2403
Social Security contributions	37878,13	0,0726
Raw materials	50 956 800,00	97,6320
other expenses	1044070,87	2,0004
<b>Total</b>	<b>52 192 730,98</b>	<b>100,0000</b>

Source: Created by the author Roshchupkina

Produce cost is one of the most important indicators reflecting the efficiency of a business. It demonstrates the expenses of the business for the production and the amount of revenues from the sales, i.e., the basics for price formation. The cost of production and the profit are inversely proportional: a decrease in cost leads to a corresponding increase in profit and vice versa. Table 9 shows that the total cost of the enterprise is 52,192,730.98 thousand rubles. The largest share in the cost structure falls on raw materials, which amounts to 97.6320%.

The business plan for the mini-oil refinery should be viewed as an integral component of a broader conceptual model for the development of regional socioeconomic systems. This approach is also explored in detail in a separate study by Rodionov et al. [26], emphasizing the strategic significance of such initiatives.

Moreover, the role of small and medium-sized enterprises (SMEs) in spurring innovation is critical, as highlighted by Rodionov et al. [27]. Their research indicates that SMEs contribute significantly to the innovative landscape of a region, particularly through their flexibility and responsiveness to market changes. By integrating the mini-oil refinery within the local economic fabric, there is a dual opportunity to boost the regional economy and to position the refinery as a nucleus for innovation and industrial synergy [28].

The establishment of a mini-oil refinery requires careful consideration of environmental regulations, the socioeconomic context of the region, and the existing industrial infrastructure [29]. The business plan must address these factors comprehensively, ensuring that the refinery's operations are sustainable and that they align with the broader goals of regional development [30]. The plan should specify the exact environmental and industrial regulations that impact refinery operations. It will outline procedures for ongoing compliance checks and regular updates to ensure that the refinery operations adapt to new or amended regulations. Also, the business plan need feature a comprehensive stakeholder engagement plan that includes timelines, specific engagement activities, and responsible parties. This plan will focus on regular and transparent communication



with local communities, environmental groups, and other stakeholders. Moreover, to align with regional development goals, the business plan must include specific sustainability objectives, such as reducing carbon footprints, promoting energy efficiency, and supporting local sustainability projects.

Furthermore, the potential for scalability should be considered. As the refinery begins to positively impact the local economy, there may be opportunities for expansion, which could include increasing production capacity or diversifying product lines to meet emerging market needs [31]. Such scalability can further embed the refinery within the regional economic structure, creating a robust platform for sustained industrial growth [32; 33].

Our strategic plan for scaling and geographically diversifying the mini-oil refinery focuses on modular expansion, product diversification, and targeted market entry. This approach ensures adaptability and growth in new regions while maintaining compliance and sustainability. The refinery's design features modular components that allow for flexible scaling. Our entry strategy includes detailed market analysis, regulatory compliance checks, and partnerships with local entities to facilitate smooth integration. To adapt to changing market it is needed to develop capabilities to produce specialty chemicals and eco-friendly fuels, supported by ongoing research and customer feedback analysis. Also, critical to supporting expansion is the development of robust logistics and infrastructure. This streamlined strategy outlines clear steps for scaling operations and entering new markets, ensuring the mini-oil refinery's growth is sustainable and aligned with broader economic and environmental goals.

This study has limitations that should be acknowledged. The research is geographically focused on a specific territory within the Russian Federation, which means the findings may not be directly applicable to other regions with different economic, regulatory, and market conditions. Future research may conduct an analysis compare the feasibility and impact of mini-oil refineries in different regions within Russia and in other countries with similar economic contexts. This would help in understanding the broader applicability of the business model.

## VI. CONCLUSION

The findings of this study have successfully validated the hypothesis that implementing a mini-oil refinery in a specific territory of the Russian Federation, currently lacking local refining capacity, will significantly enhance regional economic resilience and sustainability. The comprehensive business plan developed herein provides a strategic direction for policymakers and investors, ensuring that the establishment of mini-oil refineries can effectively address the existing socio-economic challenges and promote long-term regional development. Analysis of different methodologies for business plan development demonstrates the following:

1. Among the known global methodologies for business plan development, the structure of a business plan according to UNIDO is the most suitable for the business environment in the Russian Federation;
2. Among the well-known Russian methodologies, the structure of the business plan within the application form for funding from the development budget of the Russian Federation, in the authors' opinion, is found to be the most appropriate;
3. The methodologies for business plan development reviewed in this research are optional since the structure of a business plan is not regulated by law; therefore, this document can be drawn up in any form, depending on the goal.

The results of this research indicate that the application of domestic technologies for basic oil refining processes justifies the profitability of the project for mini-oil refineries that produce high-quality petroleum products in the identified territory. Justification is proven by calculations of the financial results for the mini-oil refinery performance: the profitability of the product is 40.00%, the production profitability is 37.91%, and the turnover profitability is 71.59%.

The results of the technical and economic assessment of the project confirm that the processing depth is 65.3%, the specific capital investment is 483.53 rubles/(ton/year), and the yield of the finished products (ratio of the volume of petroleum products to the volume of processed oil) is 93.2%.



The theoretical significance of the study is presented with the systematized material on the creation of a business plan for mini-oil refineries in the identified territory. The practical significance of this study lies in the application of business plan key provisions for mini-oil refineries, which ensures their effective complex application under modern conditions. The study offers detailed strategies for scalability and adaptation to different geographic areas, highlighting how small-scale refineries can contribute to regional energy security and economic development.

The novelty of the study lies in the development of recommendations for the creation of a business plan for mini-oil refineries and the identification of specifics in business plans related to the identified territory.

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### Author contribution

All authors made an equal contribution to the development and planning of the study.

### Conflict of Interest

The authors have no potential conflicts of interest, or such divergences linked with this research study.

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