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Volume of investments required – \$ 5 million

Summary

1. **Production** – energy-saving technology to upgrade vehicular transport for the purpose of using ram air to generate electricity, production process of small (10–50 kW) self-contained air power plants.
2. **Trade marks** – in the process of formalization.
3. **Sales 2007** – none.

Company profile

Date of establishment – «AEROENERGOTEH, CJSC» as a research and development innovation small business was established in March, 2008, by the initiative of the author and developer of energy-saving technologies for transport and alternative power generation.

Description and value of capital assets – \$ 20 000 ths worth of non-tangible assets as estimated by the Chamber of Trade and Commerce of the East Siberia as of February 27, 2006.

Previous rounds of investments – none.

Signs of public recognition – Winning Award at the Innovative Business Ideas Contest for Small Businesses of the City of Irkutsk, November, 2006.

Number of employees – 2 persons.

Structure of ownership

Legal entities (Companies)	0%
Natural persons (2)	100% (50% + 50%)
Aggregate share of government property	0%

Team

Skovitin Andrei Viktorovich – Director, 40 y.o. Graduated from Irkutsk State University. 11 years experience of work in executive positions in companies of diverse proprietorship.

Kriulin Yurii Valentinovich – Director on Engineering, Chief Designer, 50 y.o. Graduated from Irkutsk Polytechnic Institute. 30 years of prototype design and research and development experience (Irkutsk, Moscow, Nizhnii Novgorod, St. Petersburg) in the field of helicopter industry, wing-in-ground-effect machine building and vehicular power plants.

Production

Proposed technology is intended to resolve in the nearest future issues associated with the shortage and high cost of energy resources, as well as the problem of negative impact of power generating facilities on the environment and exhaust from vehicular transport.

Power-saving technology shall afford to assure saving of fuel consumption by road vehicles with hybrid power plants by no less than 30% while saving up to 45–50% in electricity-powered railroad rolling stock and subway trains (savings in electric power), increase cruising range for electric road vehicles by 1.5 to 2 times.

Principle of operation of combination aerodynamic electric power plant (KAES) is similar to that of the well-known hybrid power plant. Mechanical braking action (to decrease rate of travel) via braking system of the hybrid is converted to electric power. The KAES provides, instead of mechanical, for aerodynamic braking action with subsequent conversion into electric power via controlled impeller assembly (guide vanes, louvers, etc.), making it 3 to 3.5 times more efficient than mechanical braking. This way, should an automobile with hybrid power plant generate 1 kW of electric power in the course of mechanical braking, the use of KAES (aerodynamic braking) will generate a minimum of 2 kW, which was confirmed both theoretically and by experiment.

Similar available designs in the USA are capable of converting no more than 10% to 15% of energy required for motor vehicle propulsion from ram air as they make use of inefficient process solutions, which finds its confirmation in both technology solutions proposed today and patent research conducted by Eurasian and Russian patent solicitors.

By the present time, front-end engineering to upgrade road, railroad and urban electric transport to the relevant innovative technology, was completed. Precedence for the KAES vehicular combination aerodynamic power plant was obtained from the European Patent Office (Geneva, Switzerland) on April 25, 2008. The foundation of the developed design is found in well-known aviation technology of high performance conversion of gas flow momentum used both in aviation and wind-power engineering to generate electricity. Large scope of R&D confirmed capability for high-performance use of this technology in transport and alternative power generation, as well as identified ways of subsequent improvement of stated results.

Front-end engineering to manufacture small (10–50 kW) self-contained aerodynamic power plants (AeroPPs) to

procure electricity from renewable sources of energy that afford to spend 40–50 grams of hydrocarbon fuel to generate 1 kW of electric power (instead of 200 grams at contemporary CCP combined-cycle power plants) was made ready. This technology was formalized in the "know-how" format and is now at the stage of patent application.

Current state

The company is at the initial stage of establishment and build-up of business relationships with potential partners, managers and investors. Under way are continued R&D, patent research and preparation of materials to formalize intellectual property of innovative solutions in energy-saving technologies for various vehicular transport and alternative power generation.

Development strategy

Use of funds

- | | |
|--|-----|
| 1. R&D | 60% |
| 2. Marketing | 2% |
| 3. Other (patent and licensing activities) | 38% |

Procurement of fixed and operating assets is not expected. Engagement of diverse highly professional research and production teams and their material and technical equipment to fabricate and appraise prototypes is expected.

Prospective outcome of investment

The investment is expected to yield:

1. Upgrade of laboratory test-bench power-saving units for various vehicles and alternative power generation to the level of operational prototypes.
2. Obtaining of international patents for available subjects of intellectual property and international patents issued in the course of subsequent activities of the company (estimated no fewer than 10 patents within 3–5 years).
3. Licensing contracts and agreements with transport and energy companies for the use of innovative patented technologies in Russia and abroad.

Marketing & Markets

Within given timeframe (2010–2030 onwards), use of KAES energy-saving technology to generate electricity from ram air to a vehicle (automobile, trolley coach, electric train, etc.) is proposed.

Available intellectual property shall afford to assure prospective investors and partners a reliable and profitable investment of funds for the next 15–20 years (license sales) while getting high rates of return and profitability when mass production is commissioned as leading positions are achieved in both economic factors in transport and power generation and high environmental component of proposed KAES technology.

Primary consumers of mature technologies are the countries with acute demand and need for environmentally clean vehicles and generation of power from renewable, environmentally friendly sources of energy.

Expected market share of the total number of road vehicles manufactured in the world (Japan, Germany, Sweden, Italy, France, USA, Russia) to implement the KAES technology within 5 years may make:

1. to upgrade road vehicular transport with hybrid power plants 10% to 15%,
2. to upgrade electric road vehicles and public electric transport (trolley coach, tram, subway, etc.) 15% to 20%.

Side by side with the proposed technologies to replace hydrocarbon fuel in transportation (biomass fuel, hydrogen fuel, chemical power generators, etc.), implementation of KAES technology by the year 2012 is confidently expected at the level of no less than 10%, making an order of \$ 85 mln.

For alternative power generation (share of the world energy market not above 5%), the share of our company may make 1.5% to 2% of all alternative producers by the year 2012.

Interaction with investor

Investor share is 25% to 50% within the framework of establishing new or development of existing enterprise.

Financial characteristics, \$ thousand

Data	Facts			Forecast	Forecast with the investment required			
	2005	2006	2007	2008	2009	2010	2011	2012
Sales	-	-	-	-	20 000	45 000	60 000	85 000
Operating income	-	-	-	-	10 000	25 000	40 000	50 000