



POWER MACHINES

creating energy

Power Machines as an example of competitiveness of the Russian business

London, 12th of April 2005



Power Machines (former Energomachexport) carries out the sales and marketing function for complete equipment delivery and turnkey projects both domestically and internationally



LMZ designs, manufactures, maintains and installs steam (20-1,200 MW), hydro (4-20 MW, 70-800 MW) and gas (100-150 MW, 160MW - Siemens licence) **turbines**



Electrosila designs and manufactures **turbo generators** (with a maximum capacity of 1,200 MW), hydro generators (with a maximum capacity of 720MW) and electric motors of various sizes



KTZ (Kaluga Turbine Works) maintains steam turbines of capacity up to 35 MW, for industrial and military purposes

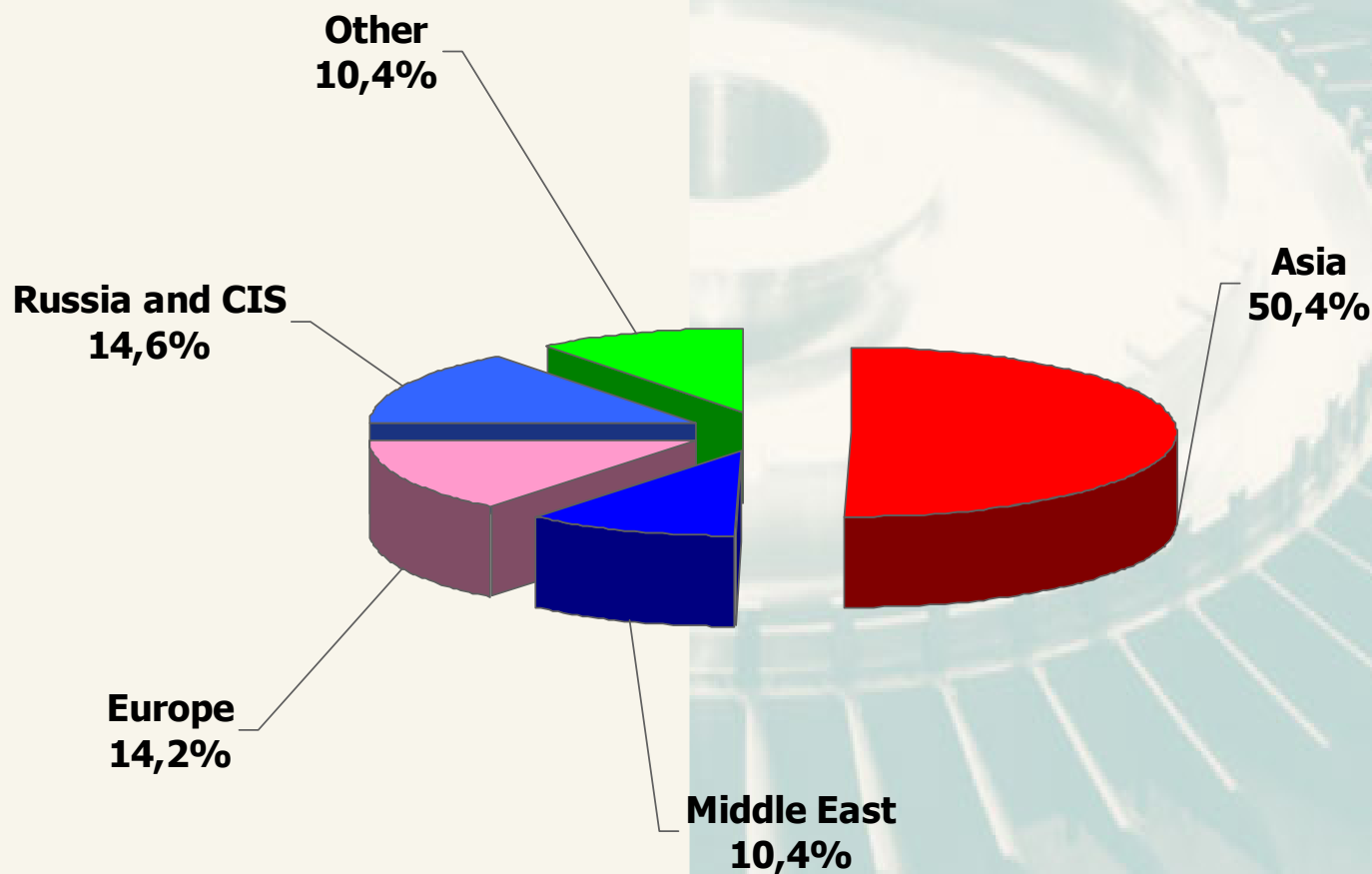


ZTL (Turbine Blades Plant) is the dominant CIS specialist manufacturer of **turbine blades** for steam and gas turbines



TzKTI is a scientific research and development venture specialising in developing new and competitive technology

The order book of Power Machines exceeds \$ 1 billion as of April 2005



Competitiveness in power industry is specified by the following factors:

- **Technical-and-economic indexes of manufacturing equipment**
- **Equipment price appeal**
- **References existence**
- **Positive track-record of the Company**

PM has all the facilities to compete successfully with leading manufacturers on the priority markets of the Company where the price-quality ratio is an “order-winner”

- Technologies: high reliability, lower expenses for service in comparison with competitors
- Price: about 15-20% lower in comparison with the Western competitors
- Good history on the key markets, such as Russia, Asia and the Middle East

PM is developing 1500 MW steam turbine with a 3000 rpm range of speed

- Company is adopting exhaust blade for low pressure cylinder made of titanium with working section of 1200 mm manufacturing

PM executes rehabilitation of turbines with unique and high-efficiency technology

- Rehabilitation of low pressure cylinder of 200 and 300 MW turbines is executed on the basis of 960 mm and 1200 mm exhaust blade and unit-forged rotor, which significantly increases durability of low pressure cylinder. Thereby rotor's mass-volume specifications remain the same, so there is no liability for understructure reconstruction

Technical level of PM – NPP turbine-set



NPP	Country	Manufacturer	Output (MW)	Heat rate (kJ/kWh)
Arabella	France	Alstom	1500	10084
Byron	USA	Westinghouse	1175	10450
Fermi 2	USA	General Electric	1154	10273
Tiange	Belgium	Alstom	1048	10305
Fukusima	Japan	Hitachi	1100	10570
Rovenskaya	Ukraine	PM	1030	10295
Tian Wan	China	PM	1060	10185
Leningradskaya*	Russia	PM	1550	9888

* Planned putting into operation in the year 2010

Technical level of PM – TPP turbine-set



SPP	Country	Manufacturer	Output (MW)	Heat rate (kJ/kWh)
Niederhausen C	Germany	Siemens	1012	1675
Schwarze Pumpe №1,2	Germany	Siemens	856	1746
Kostromskaya GRES	Russia	PM	300	1735
Alholma	Finland	PM	255	1760

Technical level of PM – turbo generators



Performance	PM	World level
Achieved output, MW	1200	1485
Range of speed, rpm	1500 – 3000	1500 – 3000
Efficiency, %	98,6 – 98,85	98,6 – 98,85
Rotor vibration, micron	30	30
Noise level, dB	87-92	85-89

Technical level of PM – hydro generators



Performance	PM	World level
Achieved output, MW	720	727
Range of speed, rpm	50 – 750	60 – 1000
Efficiency, %	97,2 – 98,7	97,0 – 98,6
Working life	up to 50 years	30-50 years
Margin of safety	0,999	0,995-0,999

- **Barh TPP**

Turn-key construction of 3*660 MW power generating units with a supercritical parameters equipment. Main competitors: BHEL with Siemens. Contract value - \$270 million

- **Sipat TPP**

Turn-key construction of 3*660 MW power generating units with a supercritical parameters equipment. Main competitors: Alstom and Toshiba. Contract value - \$250 million

- **El Cajon HPP**

Equipment delivery for 2*375 MW generating units. Main competitors: General Electric and Voith Siemens. Contract value - \$147 million

- **Quileco HPP**

Designing, manufacturing, delivering, installing and adjusting of hydro turbines for 2*36,5 MW power generating units. Main competitors: Voith Siemens Hydro, Alstom and General Electric. Contract value - \$22 million

- **Caracoles HPP**

Delivering of 2*62,6 MW turbines, wireways, pressure tunnel, supporting system and other hydro mechanical equipment. Main competitor - Voith Siemens Hydro. Contract value - \$10,9

- **PM is not an EPC-contractor**
- **PM doesn't work with BOT projects**
- **PM is a manufacturing company**

Our objectives:

- **To sell maximum volumes of our equipment with an ultimate efficiency**
- **To be a general supplier of a machinery hall in the projects carefully selected with respect to risks and our financial capacities**

- **Currently Power Machines produces most of its power generating equipment for export**
- **Hereafter Russia and CIS will be essential markets for Power Machines: building of new power assets and programmes of modernization of existing power assets**

Energy strategy of Russia until 2020

- Program of modernization of power units
- Program of construction of new power stations
- Power saving

Restructure of RAO UES

- Projects implemented and invested by **RAO UES**
- OGKs/TGKs – new clients

Development of nuclear power

- “Water-cooled power reactor 1500” project
- Completion of existing NPP

Russia’s entrance into the WTO

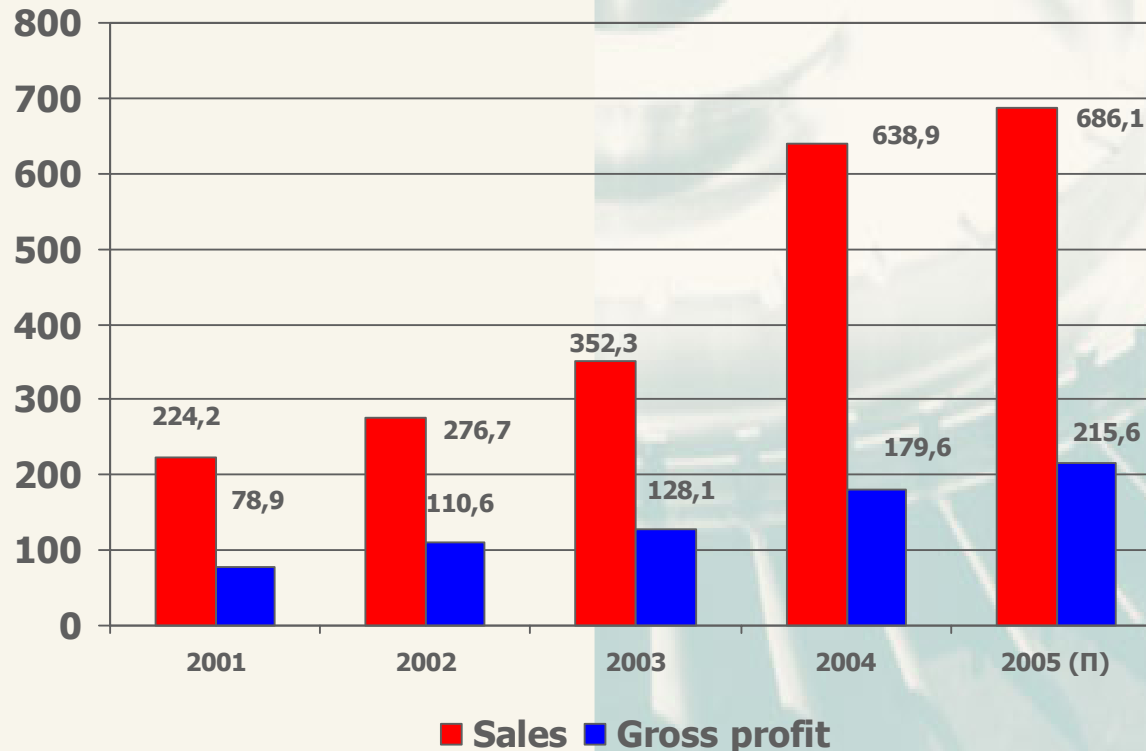
- Import fees decrease – business struggle at the Russian market

- **Concentration on our traditionally effective products: steam and hydro turbines and generators**
- **Development of the gas turbine “GTE-65” and high utilization of GTE-160 potential**
- **Complex solutions with regard to service and equipment rehabilitation**

PM as a generator of Russian economy



- **Certainly, state plays a great role in competitive edge of the economy achievement, creating an attractive conditions for investments**
- **Successful company is an attractive investment object, so it is impossible to overstress the importance of the companies role in the process of Russian business competitiveness improvement**



- **Market cap. – not less than \$ 900 million**
- **Sales – \$ 1000 million**
- **Order book – \$ 3 billion**
- **EBITDA – 17%**
- **Contract's share – not less than 50%**