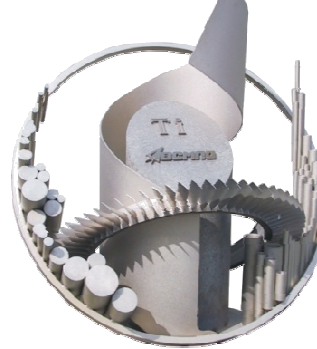


Russian Aerospace and Titanium Markets

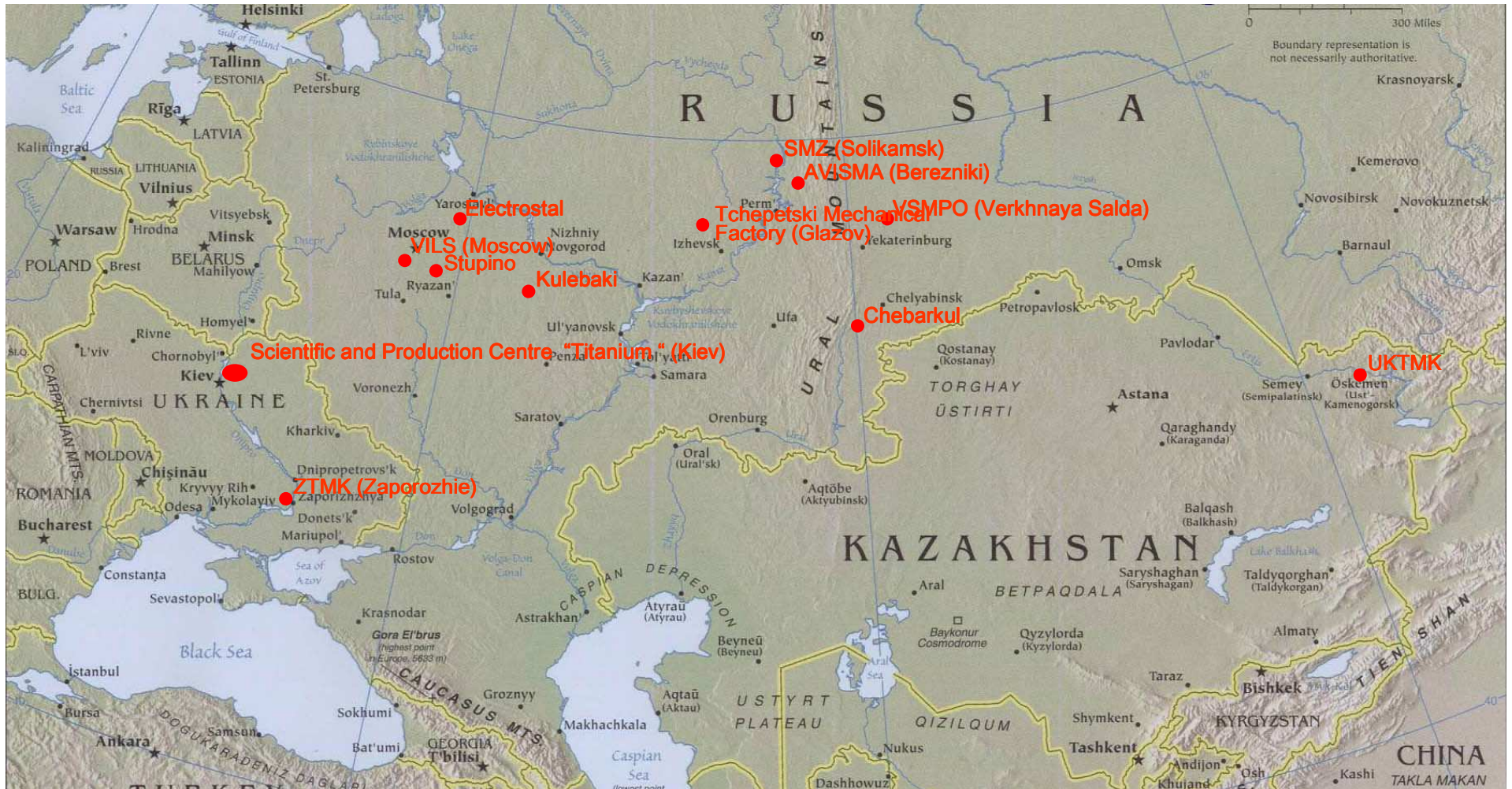


Geoff Hartle, VSMPO Tirus Ltd

The Belfry
23rd – 24th June 2009



Production within CIS



Milestones

- 1933** FACTORY FOUNDATION
- 1941** EVACUATION TO VERKHNAYA SALDA
- 1957** FIRST TITANIUM INGOT MELTING
- 1987** MASS PRODUCTION OF TITANIUM
- 1993** INTRODUCTION TO WORLD AVIATION TITANIUM MARKET
- 2002** BECOMING THE WORLD LEADER IN TITANIUM PRODUCTION QUANTITY
- 2002-2007**
SIGNING OF LONG – TERM AGREEMENTS WITH BOEING, AIRBUS, EMBRAER, SNECMA, ROLLS ROYCE AND OTHER COMPANIES
- 2007** FOUNDATION OF JOINT VENTURE WITH BOEING FOR DIE-FORGING MACHINING

From a small ingot to large production

1957
160 tons



1967
16500 tons



2007
25% of the
Global Titanium Market
(27540 tons)



PSC VSMPO-AVISMA Corporation on the World Map



1	PSC VSMPO-AVISMA Corporation	Manufacture of titanium products
2	AVISMA – Affiliate of PSC VSMPO-AVISMA Corporation	Manufacture of sponge titanium
3	CJSC Ural Boeing Manufacturing JV	Machining of titanium die forgings
4	CJSC VSMPO-AVISMA Tube Works, Ukraine	Manufacture of tubes
5	Titan Scandinavia, Sweden	Sales Group
6	VSMPO TIRUS, GmbH, Germany	Sales Group
7	TIRUS INTERNATIONAL SA, Switzerland	Sales Group
8	VSMPO TIRUS, Limited, England	Sales Group
9	NF&M International, Inc., USA	Processing, billets and stocks
10	UNITI LLC, CUSA (JV with ATI)	Delivery of products from CP titanium
11	VSMPO – Tirus, U.S., Inc, USA	Sales Group



The Corporation in the Global Market

VSMPO-AVISMA CORPORATION



Membership in international titanium associations



The Corporation in the Global Market

VSMPO - AVISMA

PARTICIPATION IN THE PROJECTS

Sukhoi-27

Antonov-124

Tupolev-334

Ilyushin-96-300

Tupolev-204

Beriev Be-200

Ilyushin-76

RRJ-75

Heat Exchangers

Ti
DIE-FORGING, PLATE, SHEET, BILLET, BAR,
TUBE AND WELDED TUBE

Al
SECTION, PANEL,
TUBE, SECTION

The Corporation in the Global Market

AVSMPD - AVISMA

PARTICIPATION IN THE PROJECTS

EUROPE

snecma

MTU

EADS

AIRBUS

Rolls Royce

Airbus 380

Airbus 330

Airbus 320

Ariane 5

Airbus 340

Ti

DIE-FORGING, PLATE, SHEET, BILLET, TUBE, BAR

The Corporation in the Global Market

AVSMPO - AVISMA

NORTH AMERICA

BOEING **GOODRICH**

Honeywell

General Electric

Pratt & Whitney
A United Technologies Company

EMBRAER

SOUTH AMERICA

Ti
DIE-FORGING, PLATE, SHEET, BILLET, BAR

PARTICIPATION IN THE PROJECTS

Boeing 737 NG

Boeing 777, 777 LR

Embraer 175

Boeing 787

Embraer 190

Source for Titanium Raw Materials

Volnogorsk Ore Mining and Processing Enterprise
(Ukraine) is the main supplier

KAZAKSTAN

Shakashskoye
Sotpaevskoye

RUSSIA

Central
Gryemyakha Vyrmes
Kuranakh and Bolshoy Seim
Turanskoye
Yarega

Sponge Titanium Production

Plant	Capacities, ton per year	Production in 2008 , ton
Titanium & Magnesium Plant (Zaporozhie)	12000	9930
Titanium & Magnesium Plant (Ust- Kamenogorsk)	27000	26000
AVISMA	36000	34950
A New Manufacturer Magnesium Plant (Solikamsk)	5000	60

Melting of Titanium Ingots

Plant	Types of Furnaces	Capacities, ton per year	Melting in 2008, ton
RUSSIA			
PSC VSMPO-AVISMA Corporation	Skull melting VAR	2600 42000	43040
JSC VILS	VAR	2000	400
CJSC Titanium Company of Stupino	VAR	2000	700
JSC Chepetsky Mechanical Factory	VAR	150	-
CJSC PO Zubtsovsky Machine-Building Company	VAR 2 Skull melting	500	20
UKRAINE			
Scientific & Production Center Titanium	electron-beam melting	3000	400
MK Antares	electron-beam melting	5000	600
BM Strategy	electron-beam melting	1000	500

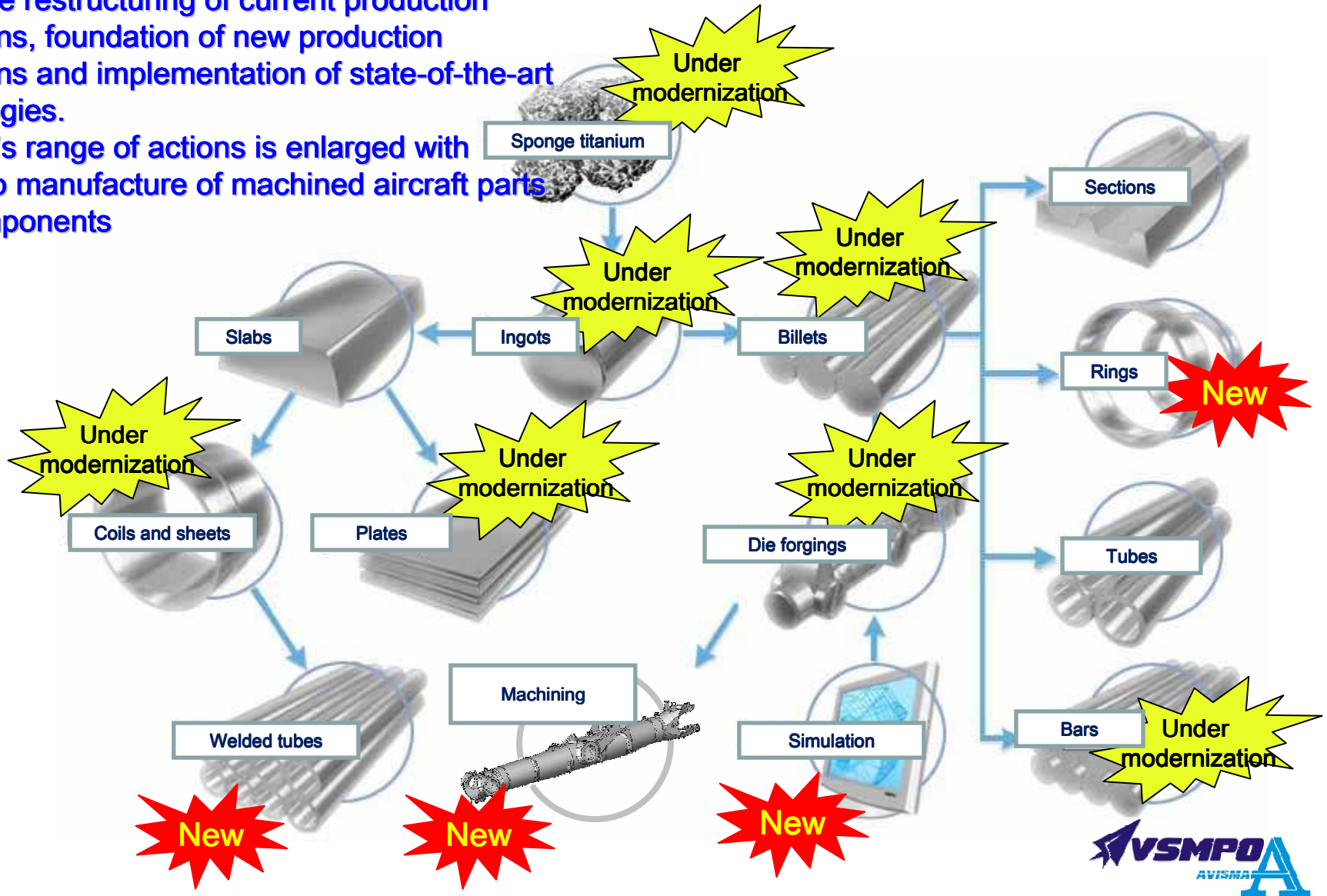
Manufacture of Mill Products

Plant	Types of mill products								
	Billets	Rolled bars	Small bars*	Wire	Die forgings	Rings	Sheets, plates	Tubes	Sections
PSC VSMPO-AVISMA Corporation	+	+	+	-	+	+	+	+	+
JSC VILS	+	+	+	+	+	-	-	-	+
JSC Ural Forge	+	-	-	-	+	+	-	-	-
JSC Kulebaki (Kulebaki)	+	+	-	-	-	+	-	-	-
JSC Electrostal (Electrostal)	+	+	-	-	-	-	-	-	-
JSC Chepetsky Mechanical Factory (Glasov)	-	+	-	-	-	-	-	+	-
JSC Machine-Building Company (Electrostal)	-	-	-	-	-	-	-	+	-
CJSC PO Zubtsovsky Machine-Building Company	+	+	+	+	-	-	-	-	-
LLC Megametal	-	-	+	+	-	-	-	-	+
* d ≤ 10mm									

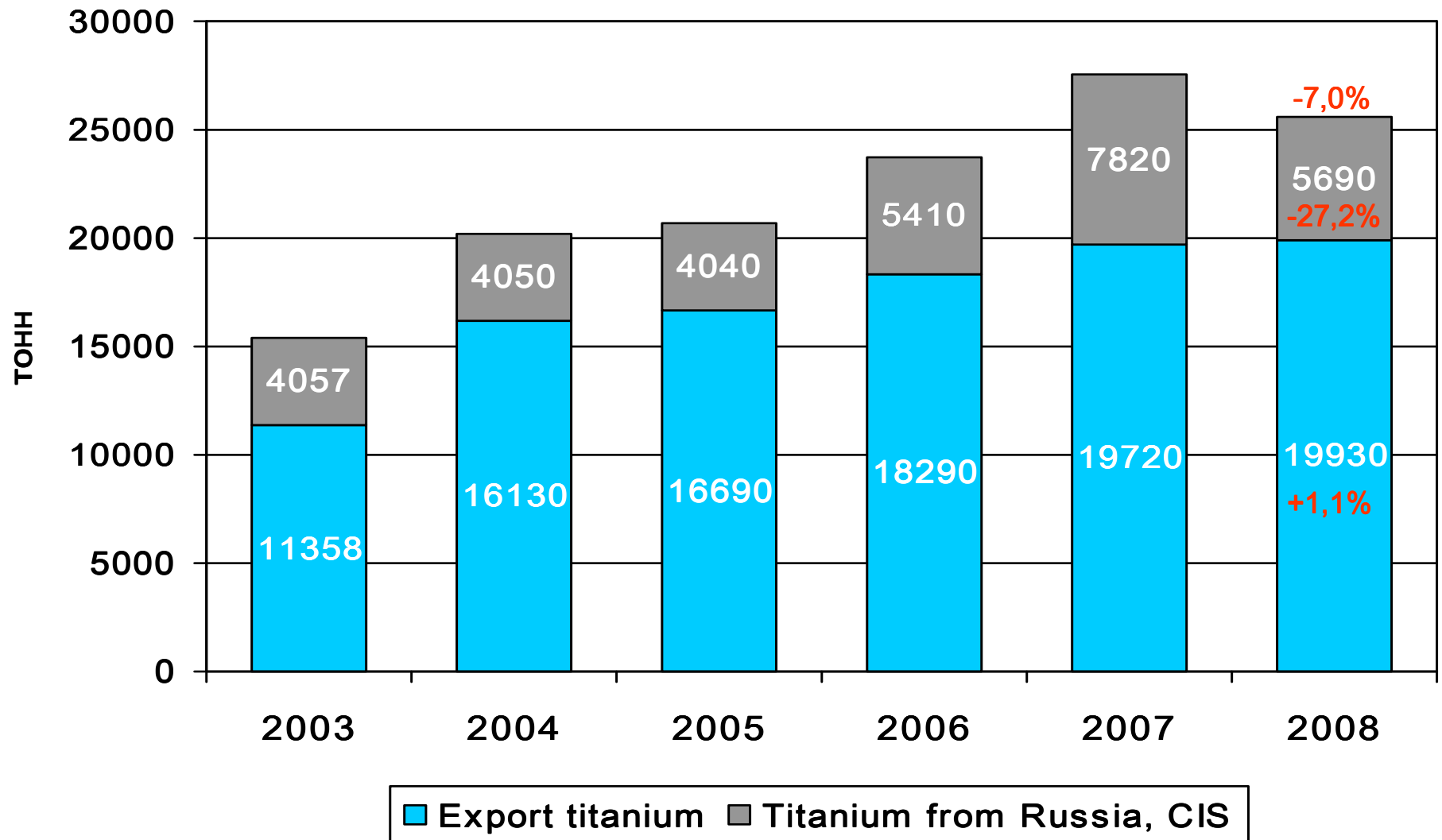
PSC VSMPO-AVISMA Corporation – complete cycle of titanium production

Full-scale restructuring of current production operations, foundation of new production operations and implementation of state-of-the-art technologies.

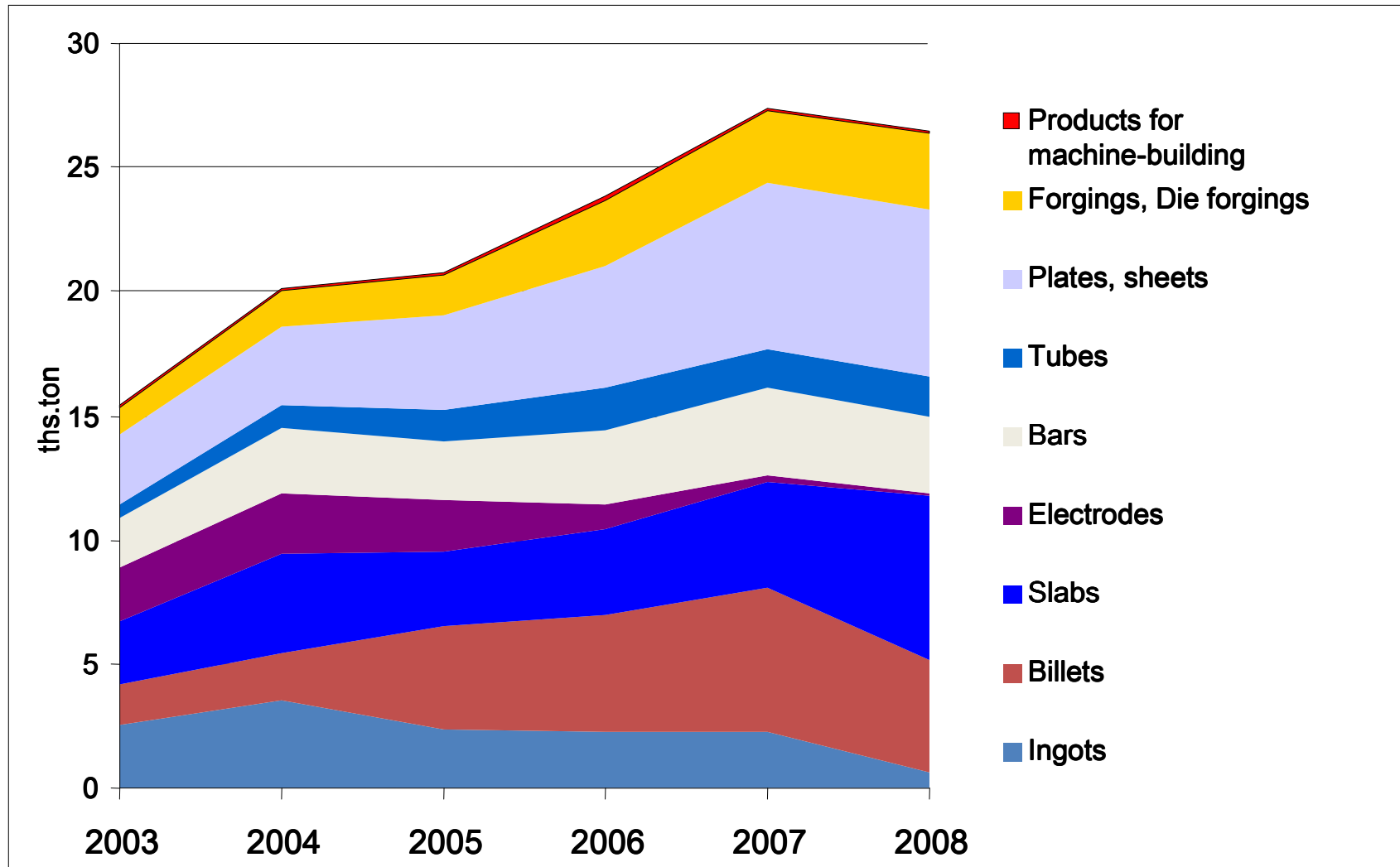
VSMPO's range of actions is enlarged with regard to manufacture of machined aircraft parts and components



Volume of titanium delivery

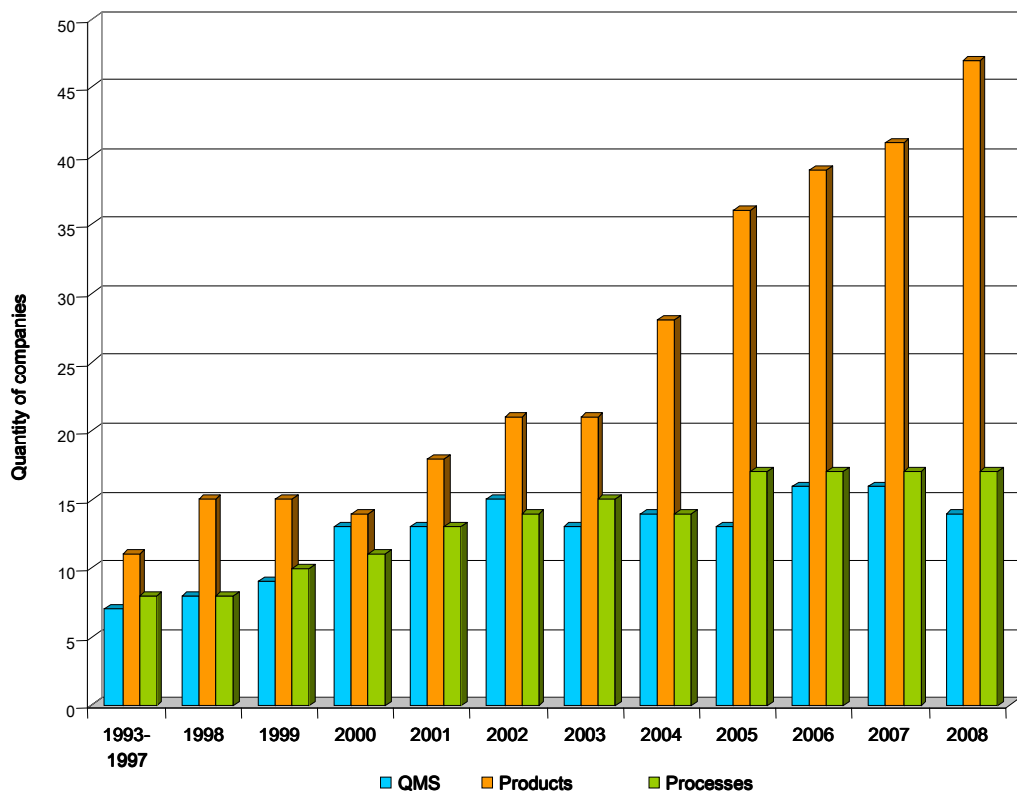


Range of Titanium Products



Certification Dynamics

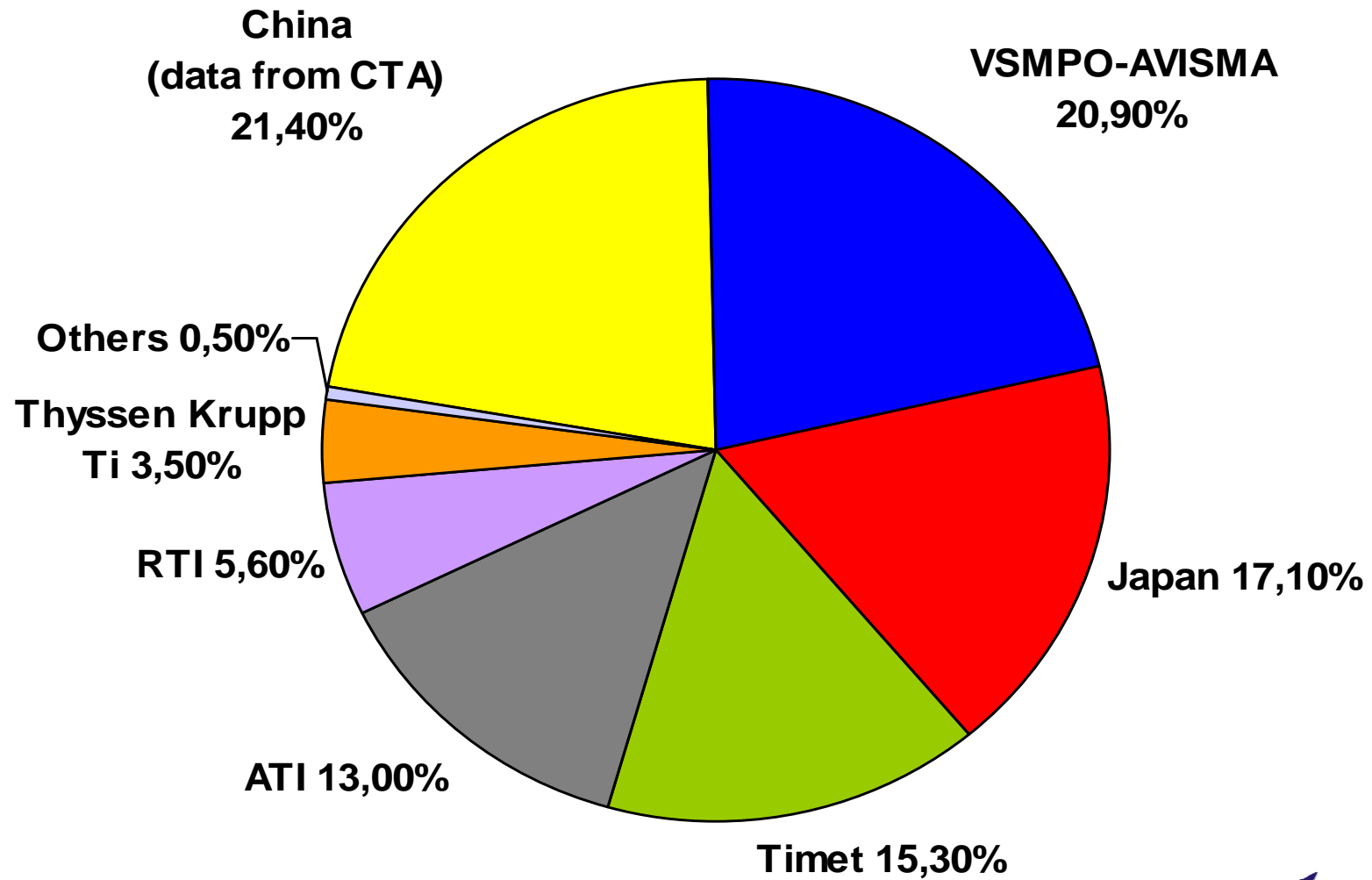
Certification Dynamics split by the Customers



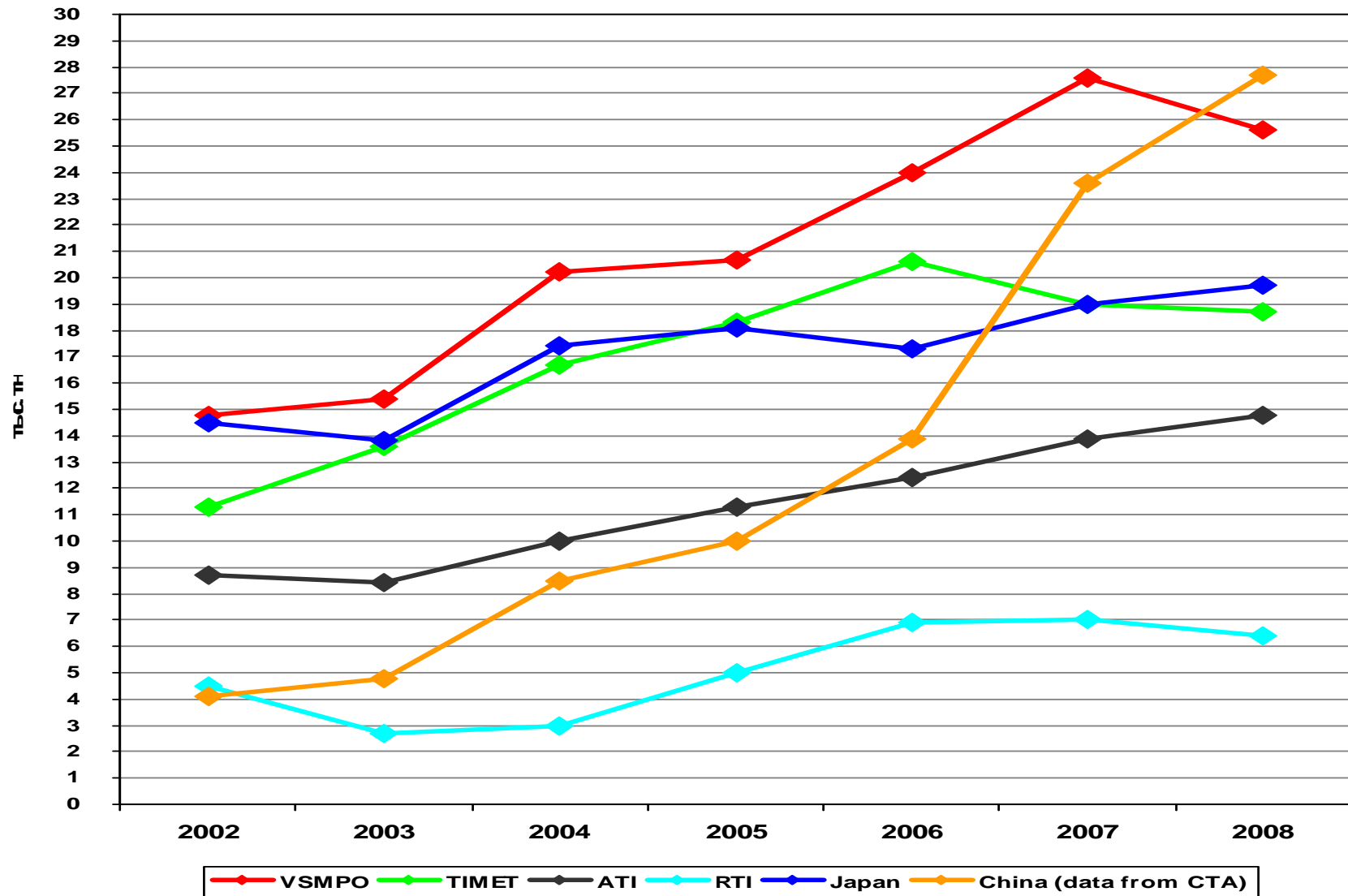
Number of approvals (as of 01.01.09)
 For quality system – 16
 For products – 184
 For processes – 96
 Total: 296

	Quality System	Products	Processes
AEROSPATIALE		5	
Agusta Westland		1	
Airbus		1	1
Astrium		1	1
AUBERT&DUVAL-FORTECH		1	
BAe Systems	1	1	
BF Goodrich		1	
Boeing	1	19	29
Bohler Schmiedetechnik	1		
Bombardier		1	
Cessna			4
Daimler-Benz Aerospace Airbus GmbH		5	
Dassault Aviation		2	
Douglas Aircraft Co		1	
Dynamet		1	
Embraer (Bra.)		1	
Fine Tubes Ltd		1	
FGUP Gidravlika, Ufa		1	
FGUP OMO named after Baranov, Omsk		1	
FGU TsGSEN		10	
General Electric	1	11	7
GKN Aerospace		1	
Goodrich		1	2
Gosatomnadzor, Ekaterinburg		4	
Hamilton Sundstrand		1	1
Honeywell		1	5
JSC Aviakor – Aircraft works, Samara		1	
JSC VASO, Voronezh		1	
JSC Reduktor PM		1	
Korean Air	1		
MAK, Aviation Register	1	1	1
Mettis Aerospace	1		
Messier Dowty	1	10	14
Mitsubishi	1		
MTU		1	2
NP STs NASTHOL, Moscow		7	
NP YuUrTO, Miass		6	
OS Karteh, Moscow		3	
OS Madifond, Moscow		8	
OS PROMMASH, Moscow		9	
OS Uralttestifikat, Ekaterinburg		7	
Otto Fuchs		1	
Pratt&Whitney, USA		16	3
Pratt&Whitney, Canada		6	5
PRI (Nadcap)	1		4
Rolls Royce	1	8	10
Russian Marine Register of Navigation		1	
Spirit Aerosystems			1
Snecma		8	6
Toshiba	1		
TUV	3	2	
VILS, Moscow		1	
VNIIS	1	11	
Westland Helicopters Ltd		1	
ZAO "Aviastar - SP", Ulyanovsk		1	

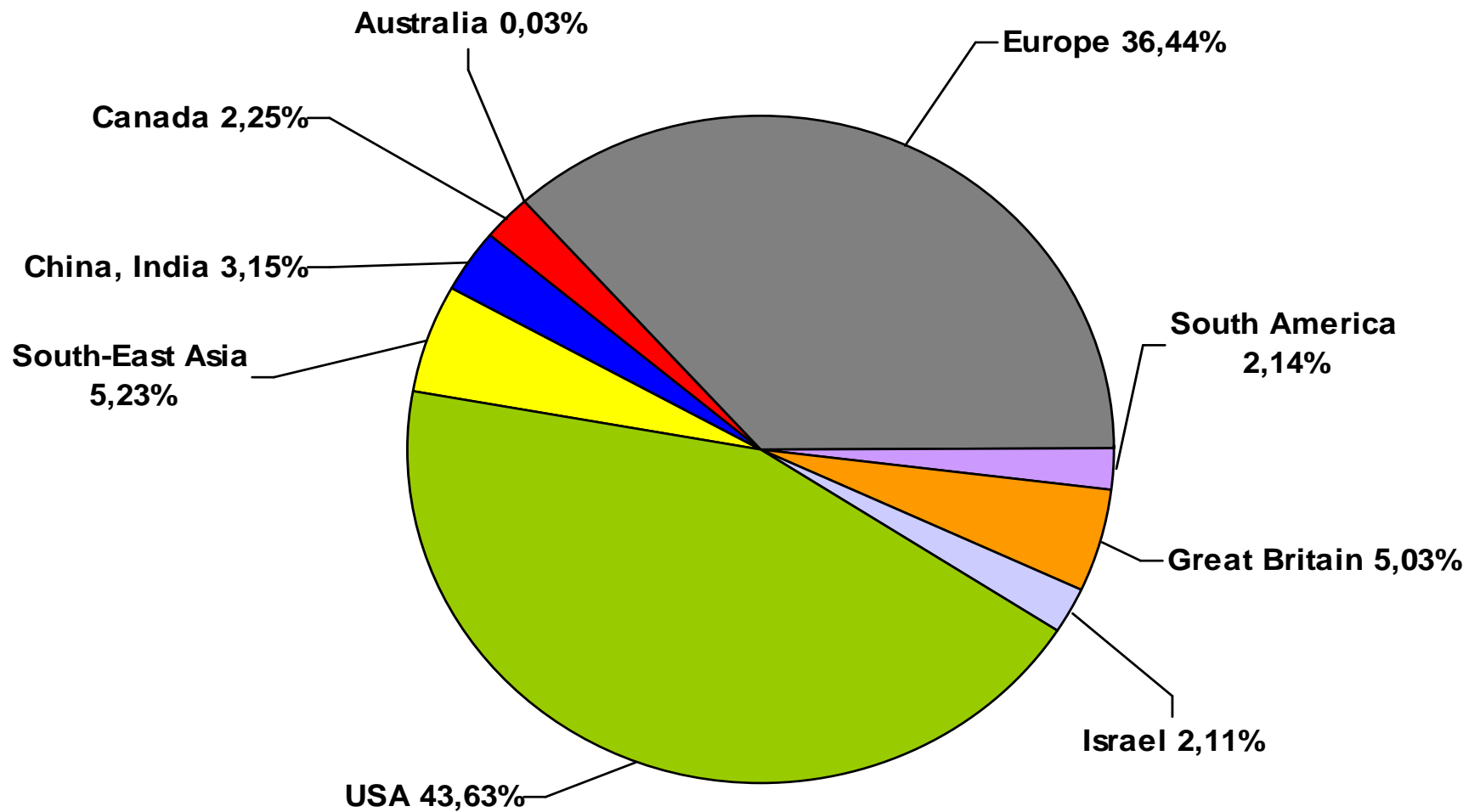
Production share of the world's titanium market



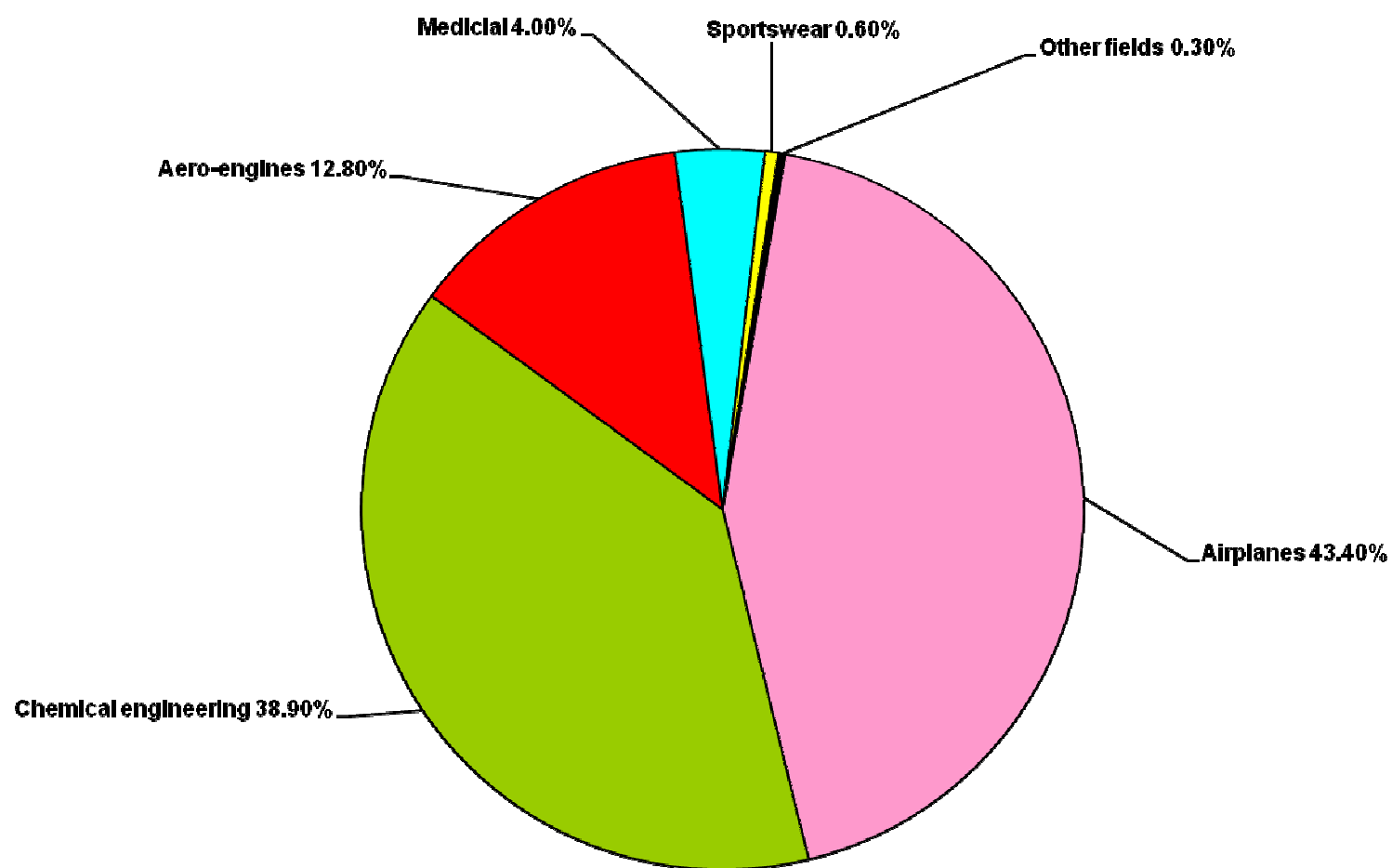
Shipment of Titanium Products



VSMPO export Sales Geography (tonnage)



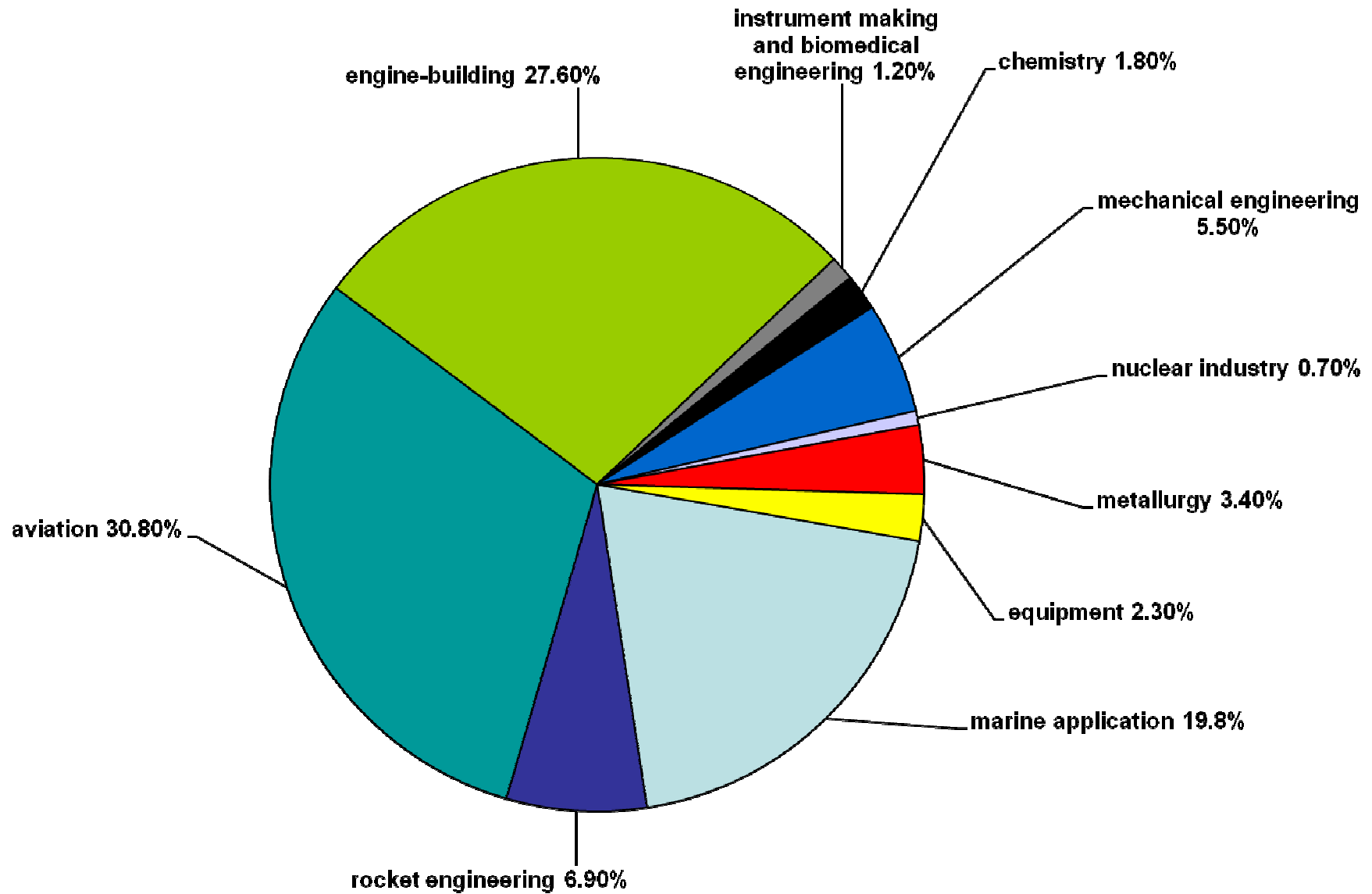
VSMPO export sales of titanium fields of application (tonnage)



Consumption of titanium in CIS

Field of application	2003		2004		2005		2006		2007		2008	
	tn	%	tn	%	tn	%	tn	%	tn	%	tn	%
Aerospace	2438	60	2010	50	1950	48	3240	60	5138	66	3713	65
Marine application	850	21	1268	31	1260	31	970	18	2025	26	1126	20
Power engineering	401	10	290	7	500	12	380	7	188	2	239	4
Oil and gas extraction	100	2	59	1,5	0	0	0	0	0	0	0	0
Chemical industry engineering	75	2	50	1,5	60	1,5	80	2	148	2	347	6
Non-ferrous metallurgy	123	3	160	4	150	4	220	4	180	2	195	4
Other fields	70	2	214	5	129	3,5	500	9	141	2	70	1
Total	4057	100	4051	100	4039	100	5410	100	7820	100	5690	100

Titanium products internal market, RF and CIS, fields of application (tonnage)



Civil airplane production forecast *

Grade	2008	2009	2010	2011	2012
IL-96	1	2	2	2	2
Tu-204/214	6	10	10	10	10
SSJ-100/Ty-334	-	4	15	15	15
AN-148 (BACO)	-	4	6	8	10
AN-148 (АВИАНТ)	-	-	2	5	7
IL-476	-	-	6	10	10
AN-140	-	-	2	4	6
Total	7	20	43	54	60

* VSMPO-AVISMA estimates based on published data



Aircraft parts manufacture



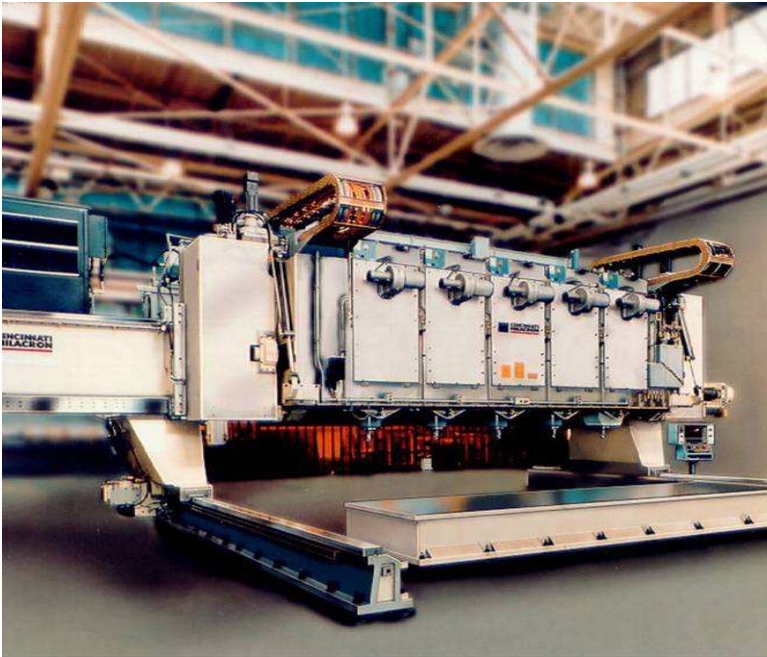
Aircraft parts manufacture



Ural Boeing Manufacturing VSMPO-Boeing Joint Venture

Major Equipment

Cincinnati Machine 5-Spindle 5-Axis Gantries



5-Axis Machining Centers



Conclusion

1. There are big resources of titanium raw material in Russia, but there is no extraction.
2. The titanium industry of Russia and other CIS countries is oriented toward export deliveries, which are 75-100% of production volumes, and integrated deeply into the world economy.
3. PSC Corporation VSMPO-AVISMA is a primary producer of titanium products in CIS countries. It supplies more than 95% of titanium rolled products .
4. New producers of titanium sponge, ingots and different types of rolled products from titanium alloys appeared in CIS countries in 2007-2008
5. Aerospace industry use approximately 65% of the consumption value in Russia and other CIS countries.
6. In Russia and other CIS countries, a market of general industry applications of titanium products, and of new fields of titanium product applications, is relatively small and it will only develop with development of the economy .

Thank you for your attention!
Any Questions?