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GEO-SOURCING TRENDS 2011

ANALYSING THE LATEST SOURCING TRENDS AND PHARMERGING
MARKETS

MOLLY BOWMAN
MARCH 23, 2011



THOMSON REUTERS

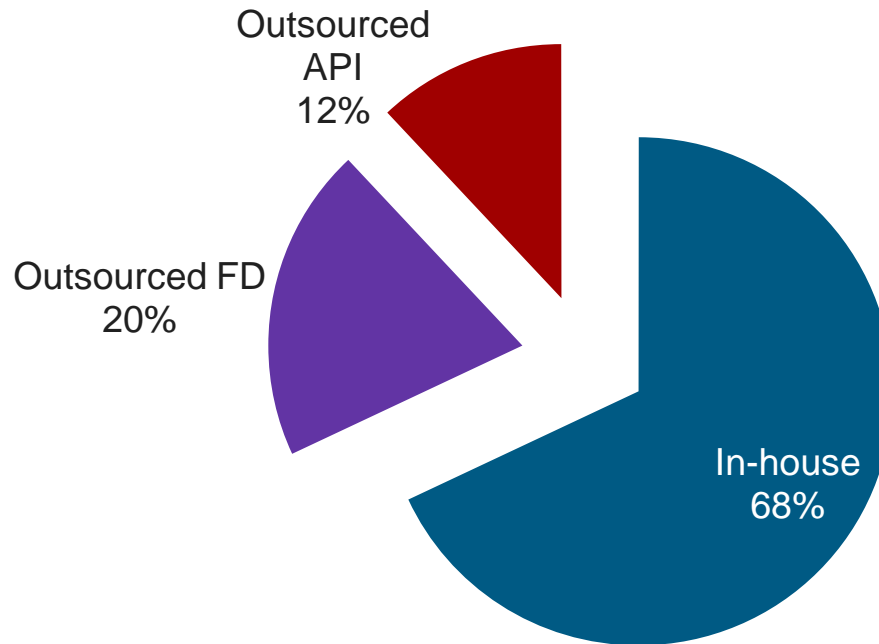
THOMSON REUTERS GENERIC & API INTELLIGENCE

- 20 years experience in tracking API manufacturing and generics
- An industry pioneer in research and analysis of global API manufacturing activity
- Develop and market the Newport database family
- More than 300 customers and 3,000 users across 43 countries in the Innovator, Generic, OTC and API manufacturing industries
- Serving the needs of
 - Business Development & Licensing Professionals
 - Portfolio Selection Teams
 - R&D and Regulatory Specialists
 - API Sourcing Specialists
- Team based in Portland, Maine, USA

AGENDA

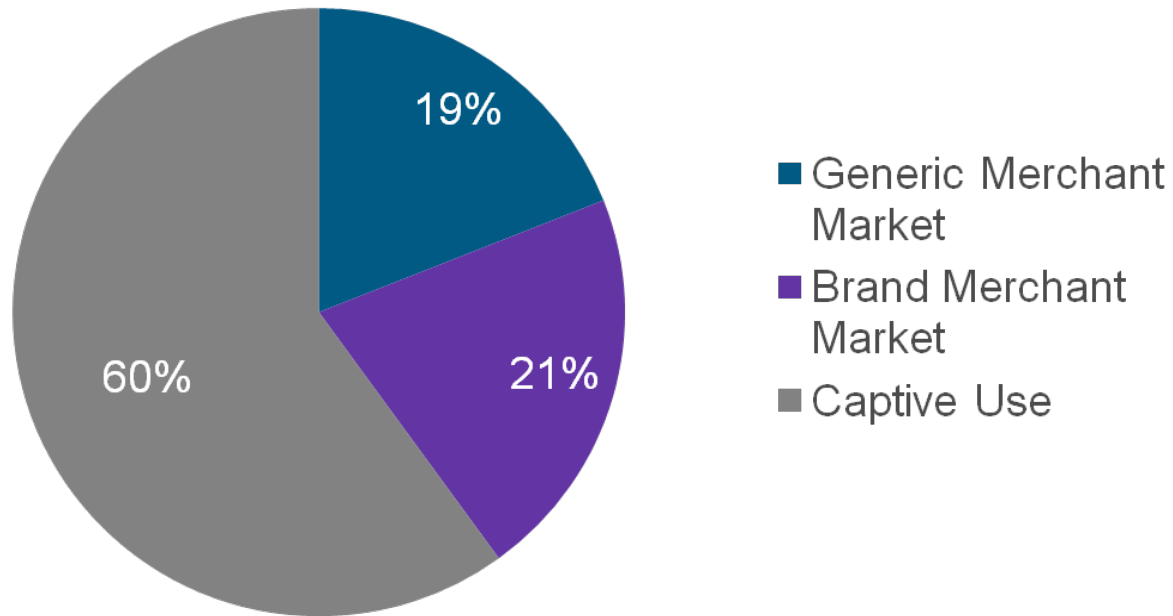
- Examining sourcing trends
- Evolution of sourcing markets
- Analyzing rising costs
- Western shift
- Pharmerging markets
- Prospects for the future

GLOBAL MANUFACTURING



- China and India projected to represent 10% worldwide outsourcing

GLOBAL API CONSUMPTION



- Global API market expected value of \$108 billion in 2015
- China and India hold 60% of Western EU API market

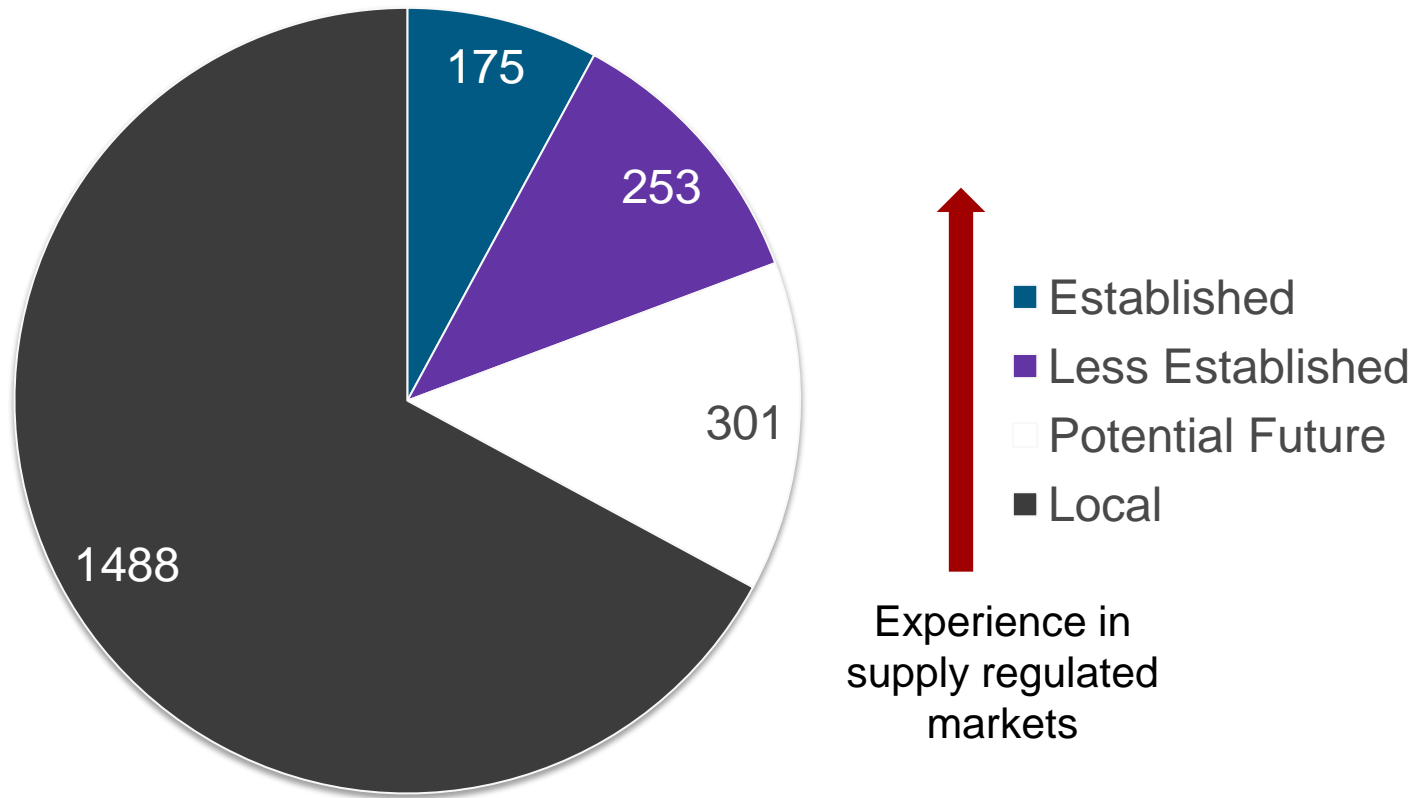
MERGERS & ACQUISITIONS

Company	Backward Integrated?	Target
Teva	✓	Barr, IVAX, Sicor, ratiopharm
Sandoz (Novartis)	✓	Hexal, Eon, Ebewe
Mylan	✓	Merck Generics, Matrix
Watson	✓	Andrx, Arrow, Sekhsaria
Hospira	✓	Mayne, Orchid
Perrigo	✓	Agis
Zentiva (Sanofi)	✓	Eczacibasi, Sicomed
Actavis	✓	Amide, Alpharma
Dr Reddy's	✓	Betapharm

DRIVERS OF SOURCING DECISIONS

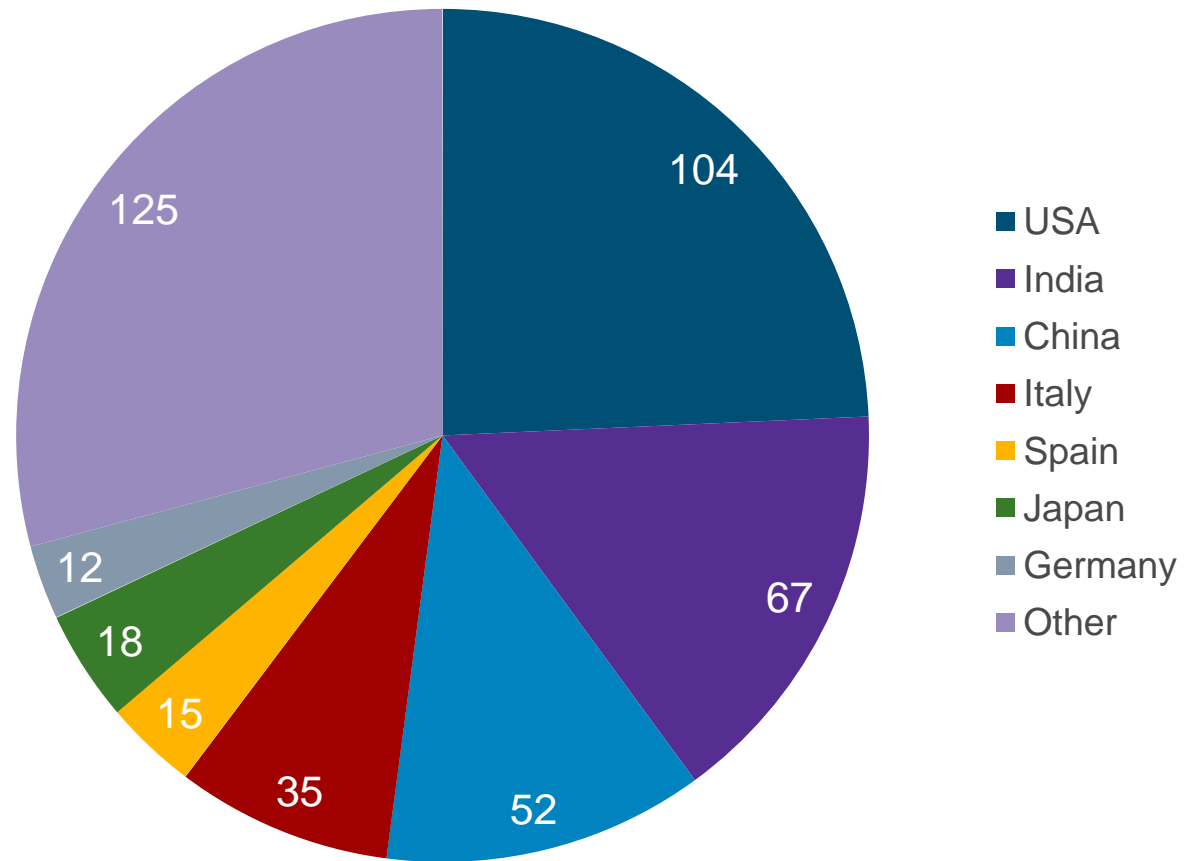
- Capabilities
- Capacity
- Quality
- Speed
- Relationships
- Cost
- Regulations
- Risk
- PR
- Logistics

API MANUFACTURING LANDSCAPE

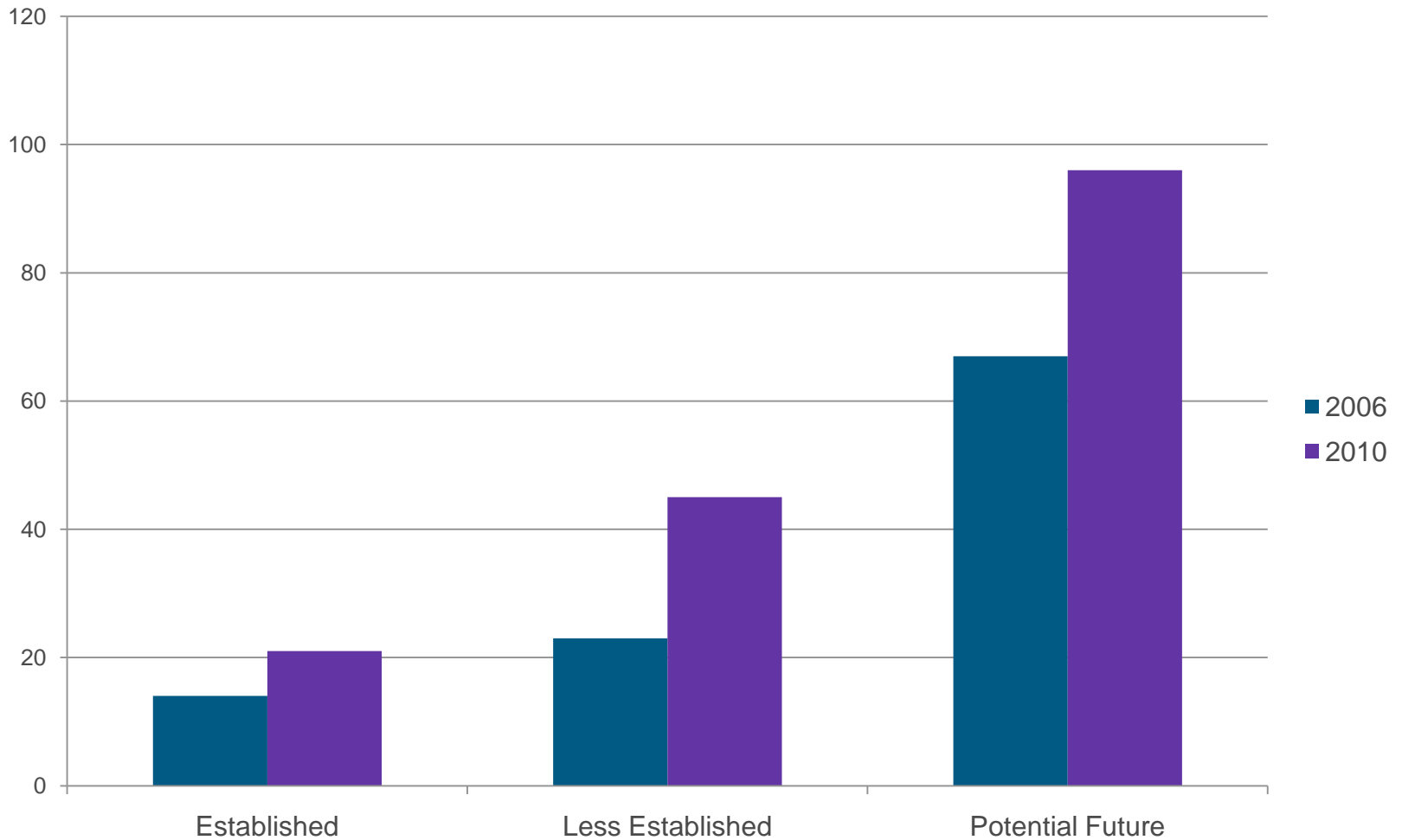


REGIONAL HUBS – API MANUFACTURING

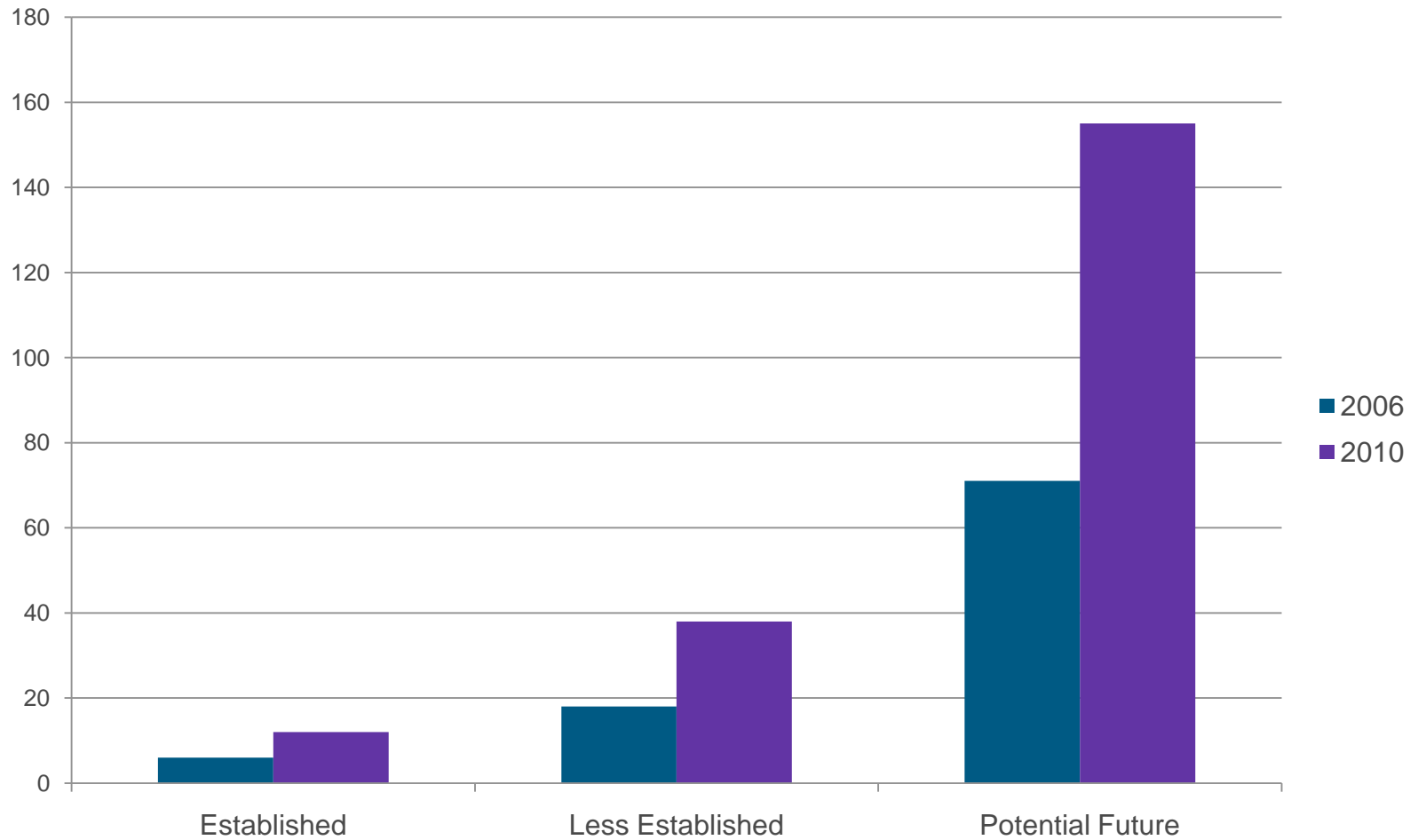
Over 1/3 of the 400+ experienced manufacturers are in India and China



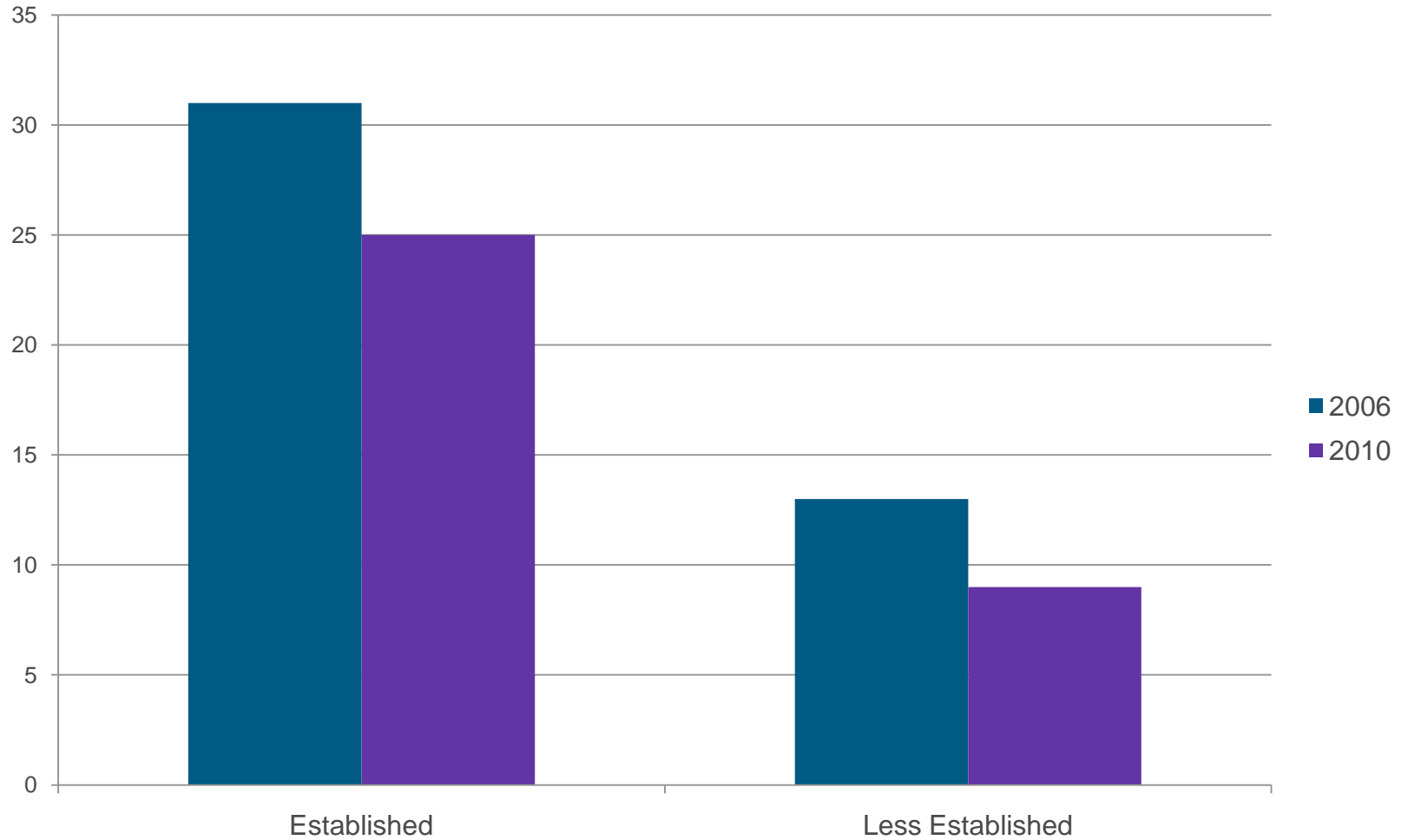
API MANUFACTURER RATINGS - INDIA



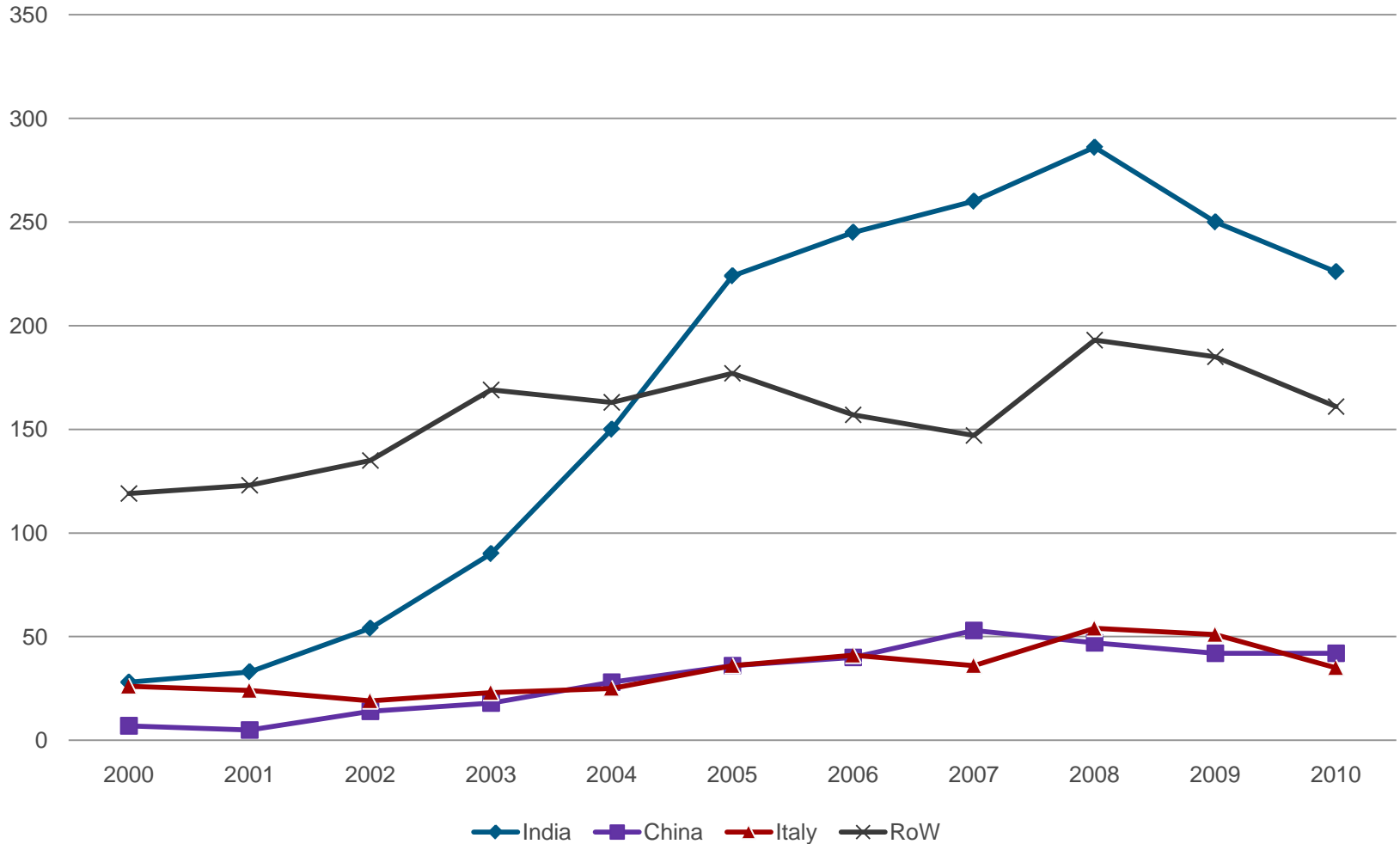
API MANUFACTURER RATINGS - CHINA



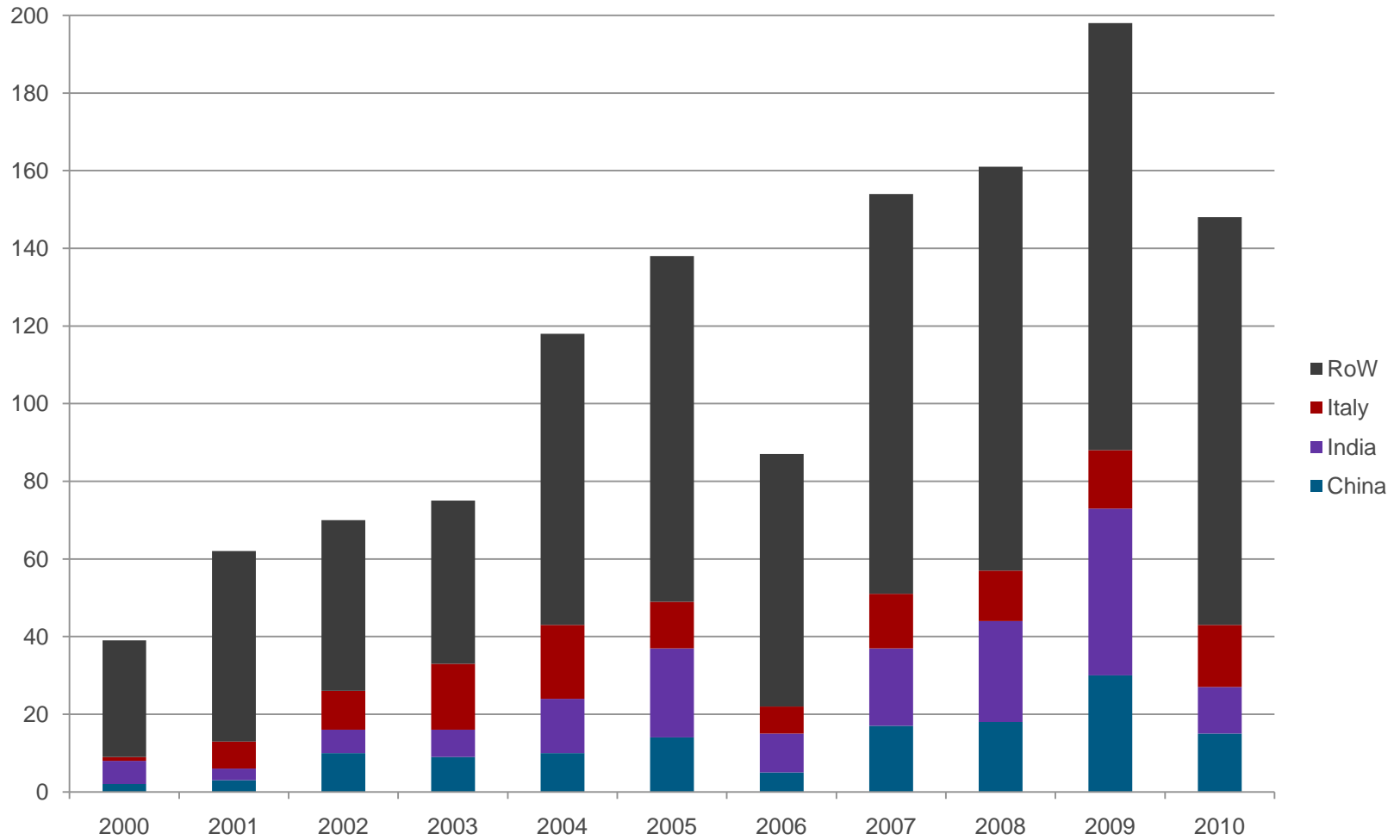
API MANUFACTURER RATINGS - ITALY



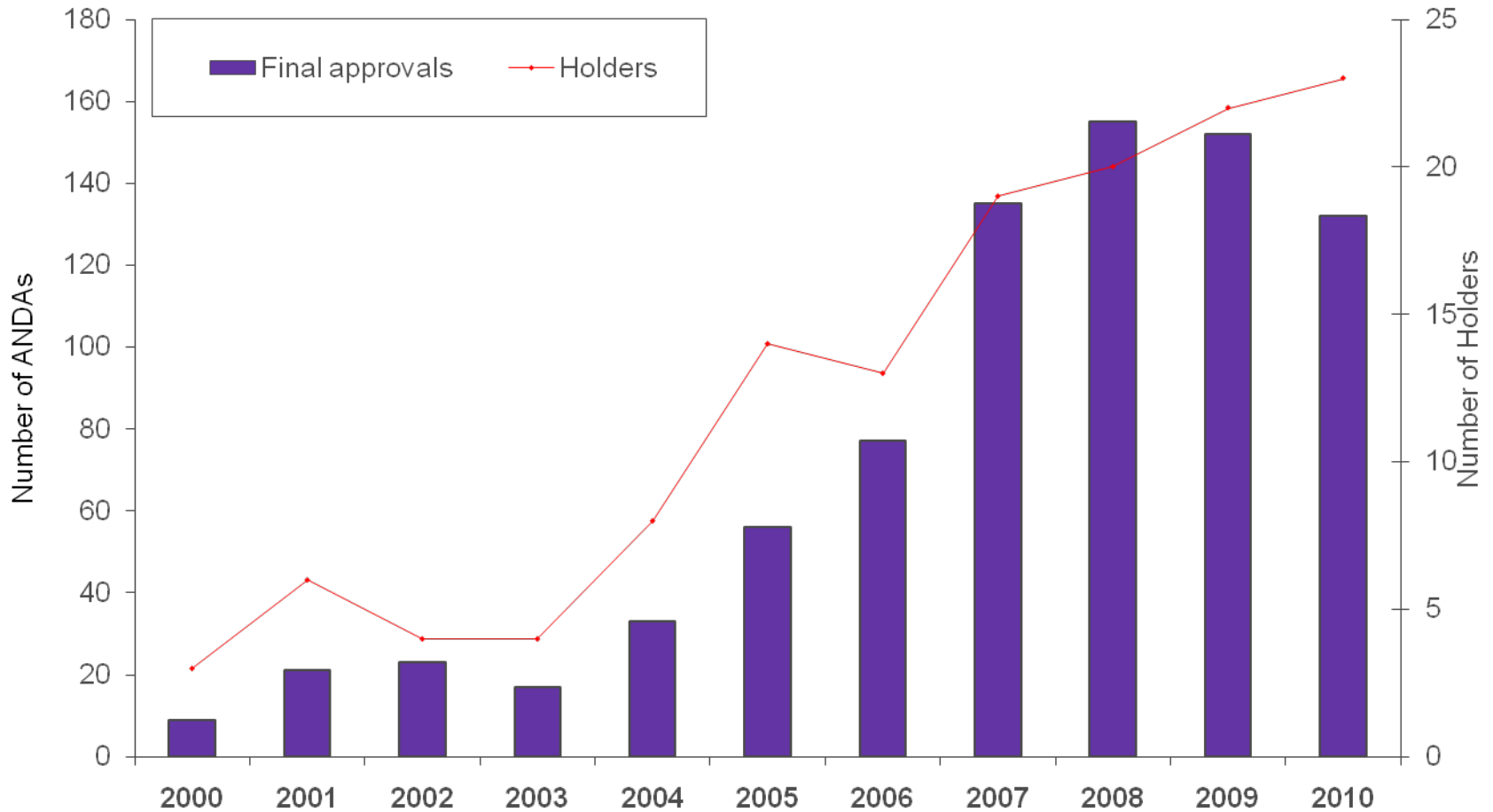
US TYPE II DMF FILINGS



US FDA INSPECTIONS



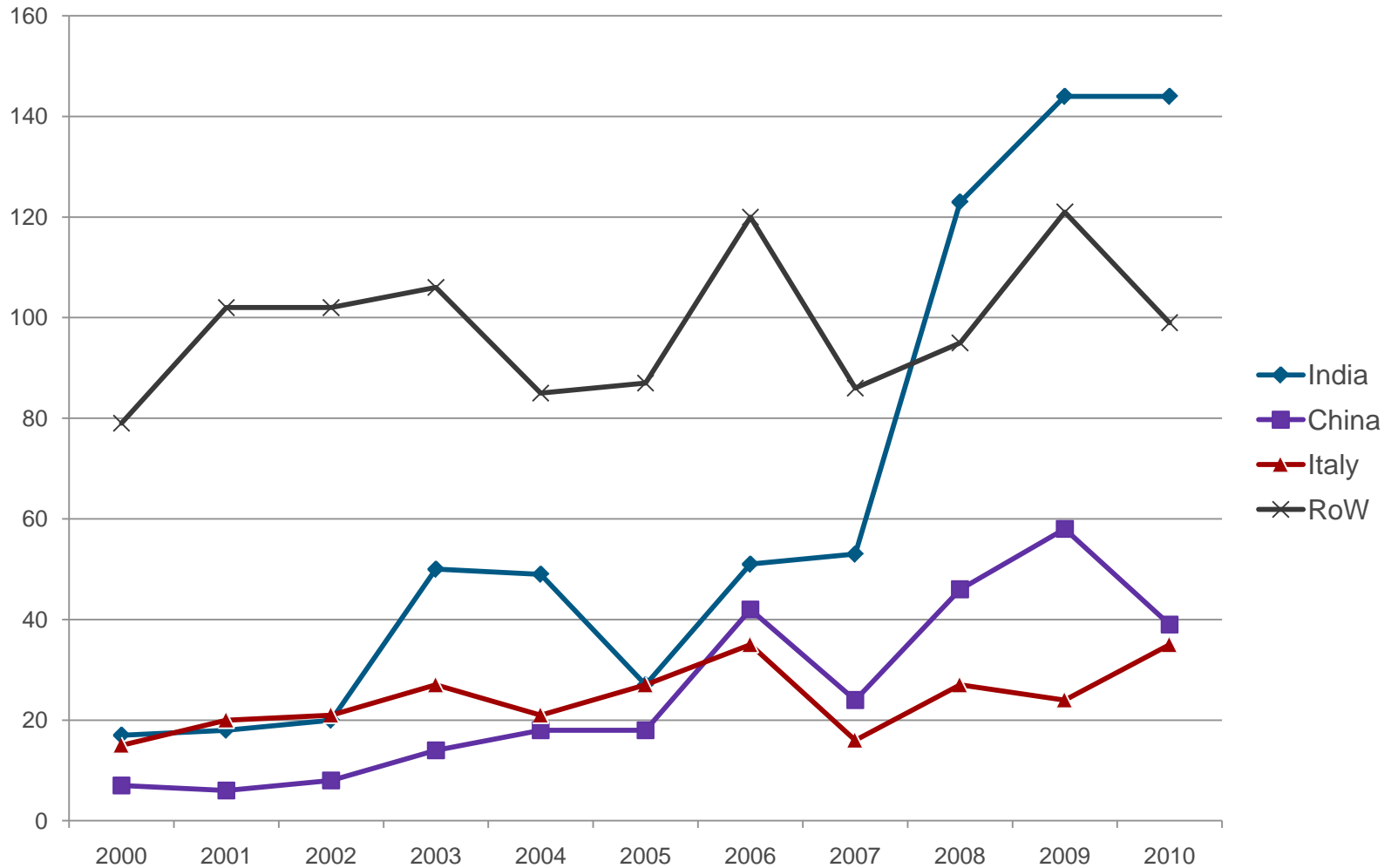
US ANDAS – INDIAN COMPANIES



US ANDAS – CHINESE COMPANIES

- Chinese ANDAs
 - First final approval in December 2010 (Novast)
- Three additional companies with final ANDAs acquired from companies like Ranbaxy, Par, Actavis
 - Zhejiang Huahai (Huahai US Inc)
 - Beijing Pharmaceutical (Beijing Double Crane)
 - Yabao Pharma Group (Beijing Yabao) (ANDAs discontinued)
- Additional filings waiting for approval
- FDA backlog slowing down manufacturing transfer to China

EUROPEAN COS FILINGS



SOURCING DRIVERS - INDIA

- Cost advantage
 - 50% less to make drugs, trials at 10% of the cost, research at 15%
- Capital efficiency
 - Up-front costs 25-50% less due to local labor, materials and equipment
- Improved process engineering drives down costs
- Capacity increasing annually
 - 2000-2004 tripled
 - Second and third tier companies now investing and reaching into regulated markets
- Rich talent pool
 - 125,000 chemical engineers and 25,000 pharmacists graduate each year
- FDA approved infrastructure only eclipsed by the US

SUPPLY AGREEMENTS - INDIA

Company	Partner	Activity
Divi's	AstraZeneca	naproxen, esomeprazole API
Hikal	Degussa	API and intermediates
Dishman	Solvay	eprosartan API
Neuland	Bausch & Lomb	besifloxacin, ofloxacin API
Alembic	Greenstone	azithromycin API
Cipla	Boehringer	amlodipine API
Ranbaxy	AstraZeneca	esomeprazole API

SOURCING DRIVERS - CHINA

- Talented pool of scientists and engineers
- Lower cost base
- Improving IP and anti-counterfeiting environment
- Leadership (cost and/or technical) in certain product classes
 - Fermentation-based APIs
 - Intermediates
 - Base chemicals
- Scale of infrastructure
- Government support for R&D

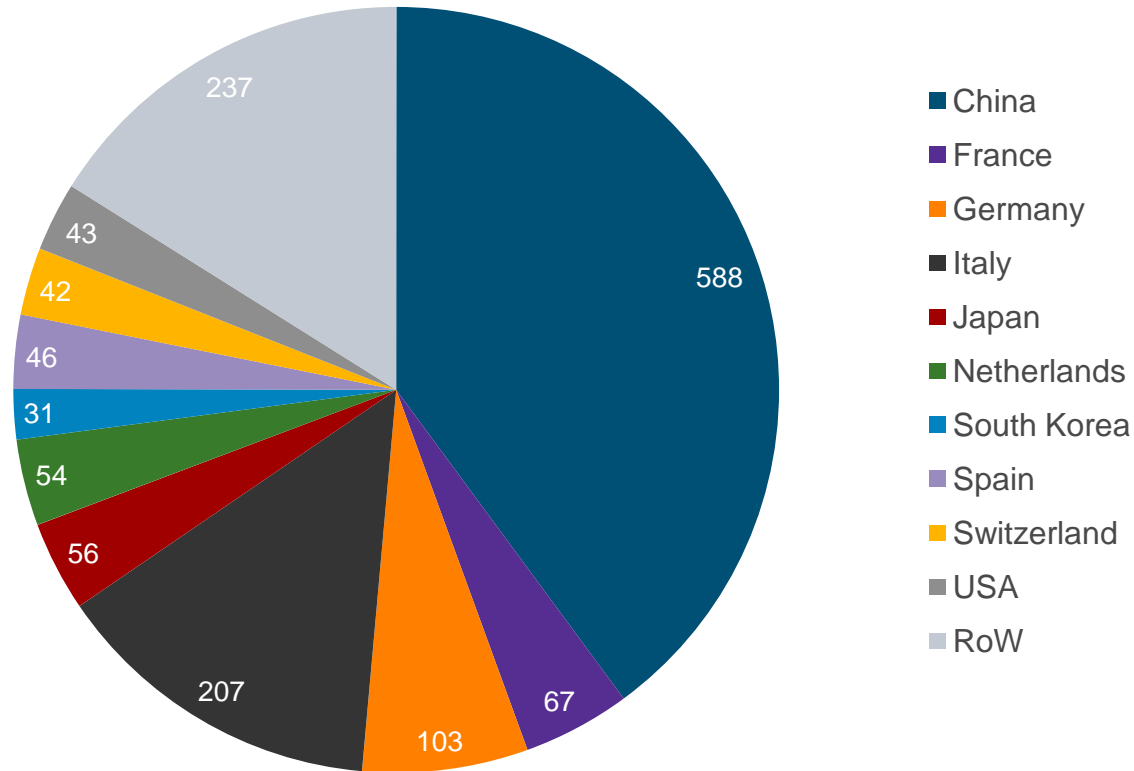
SUPPLY AGREEMENTS - CHINA

Company	Partner	Activity
Zhejiang Huahai	Merck	API, intermediates
Zhejiang Hisun	Eli Lilly	capreomycin API, vet drugs
Zhejiang Hisun	Alpharma	vancomycin API supply
Ningbo Smart	Novartis	diclofenac sodium API
Chongqing Huapont	Janssen	API supply
Hubei Shine Star	Flamma	amino acid & derivative supply
Hisoar	Boehringer	API, intermediates
Zhejiang Medicines	Hospira	vancomycin API
Shenzhen Hepalink	APP	heparin
Aurisco	Xellia	mometasone API

SOURCING CHALLENGES

Cost Type	China	India	Europe	U.S.
Labor	\$ 	\$ 	\$\$\$	\$\$\$
Environmental	\$\$\$ 	\$	\$	\$
Energy	\$\$ 	\$\$	\$	\$
IP Protection	\$\$ 	\$\$	\$\$	\$\$
cGMP Monitoring	\$\$\$	\$\$	\$	\$

INDIAN IMPORT REGISTRATIONS



Top Companies

- Organon
- Zhejiang Hisun
- Evonik Rexim SAS
- Kyowa Hakko Kirin
- BASF
- ACS Dobfar SpA
- Archimica SpA

Top Products

- clavulanate potassium
- erythromycin thiocyanate
- cefotaxime sodium
- thiamine mononitrate
- amoxicillin sodium
- amoxicillin
- ceftriaxone sodium

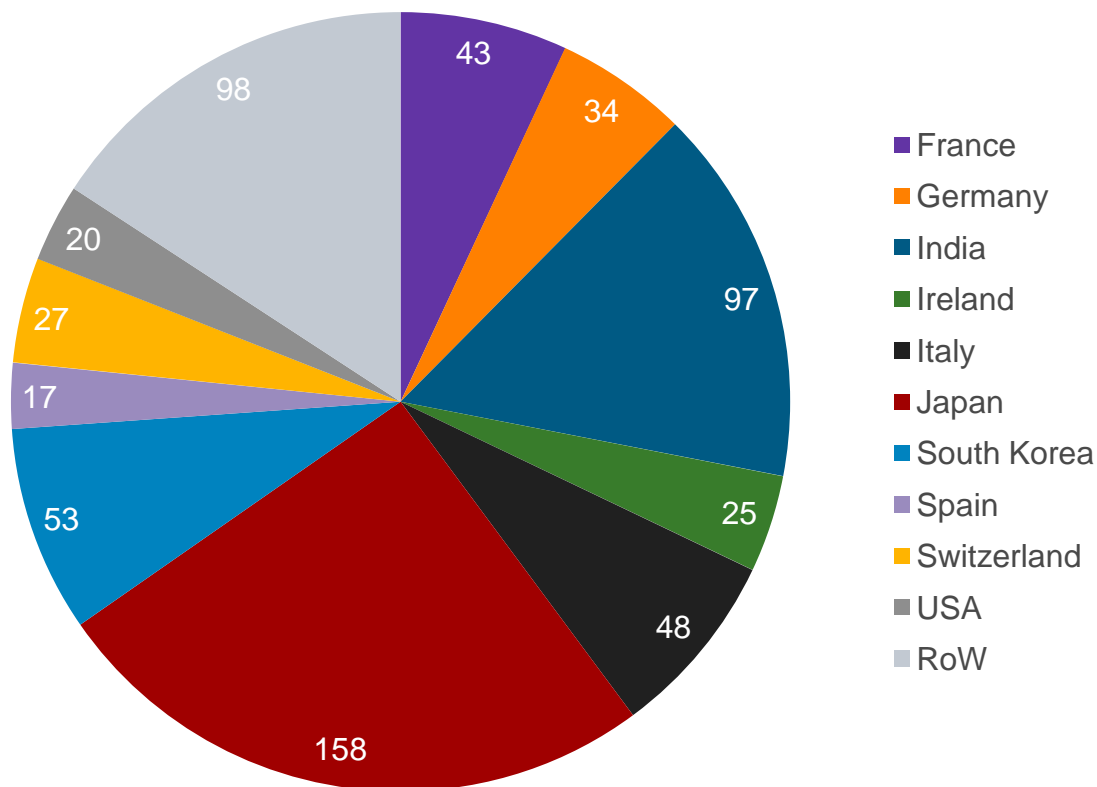
CHINESE IMPORT REGISTRATIONS

Top Companies

- Kyowa Hakko Kirin Co Ltd
- Ajinomoto Co Inc
- Ranbaxy Laboratories Ltd
- Societe Oril
- Orchid Chemicals
- Dr Reddy's Laboratories Ltd
- Janssen Pharmaceutica NV
- Evonik Rexim SAS

Top Products

- clavulanate potassium
- cefixime
- cephalexin
- amoxicillin
- cefaclor
- ceftizoxime sodium



WESTERN SHIFT

Company	Partner	Activity
Albemarle	Dr Reddy's	Ibuprofen API
DSM	Guangzhou Baiyunshan & Shandong Xinhua	Cefalexin API

- Indian companies purchasing EU made API
- Returning projects
 - Pfizer Center Source
 - tried to establish steroid production in China and Taiwan, moved production back to US and improved processes
 - Custom (UK)
 - set up a facility in China, returned to UK due difficulty finding quality management, demand from customers for EU made product

QUALITY ISSUES

- Suspended COSs from Indian & Chinese companies
 - Fleming, Shantong Jinyang, Calyx, Tianjin Zhongan
- Heparin from China
- Ranbaxy imports banned
- Apotex sourcing issues
- Aurobindo restricted imports

SPECIALIZED MANUFACTURING

- High Potency
 - Lucrative targets for API manufacturers
 - Many companies investing (SAFC, Novasep)
- Continuous Process & Separation
 - Indian companies using enzymatic catalysts
 - More Asian companies investing in micro-reactor technology
- Micronization
 - Improves formulation and dissolution properties
 - Better bioavailability, less API needed

FOLLOW-ON BIOLOGIC DEVELOPMENT

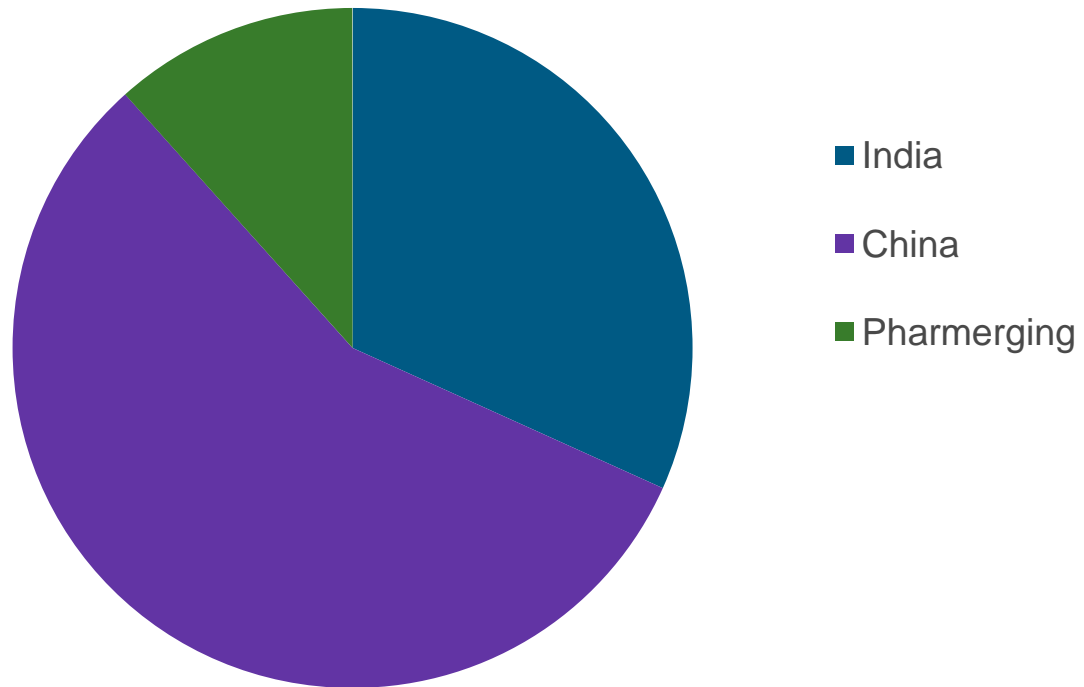
Company	Proteins	Antibodies	Vaccines	Launches
Teva	FP	UD	FP	EPO, GCSF
Sandoz	FP	UD		EPO, HGH
Biocon	FP	UD	FP	GCSF
Hospira	FP	UD		EPO, HGH
Zydus	FP	UD		GCSF
STADA	FP	UD		EPO
Actavis	FP			Via Bioton
Ranbaxy	FP	UD	FP	
Dr Reddy's	FP	FP		GCSF
Apotex	FP	UD	FP	
Cipla		UD		

Key: FP = Full Production, UD = Under Development

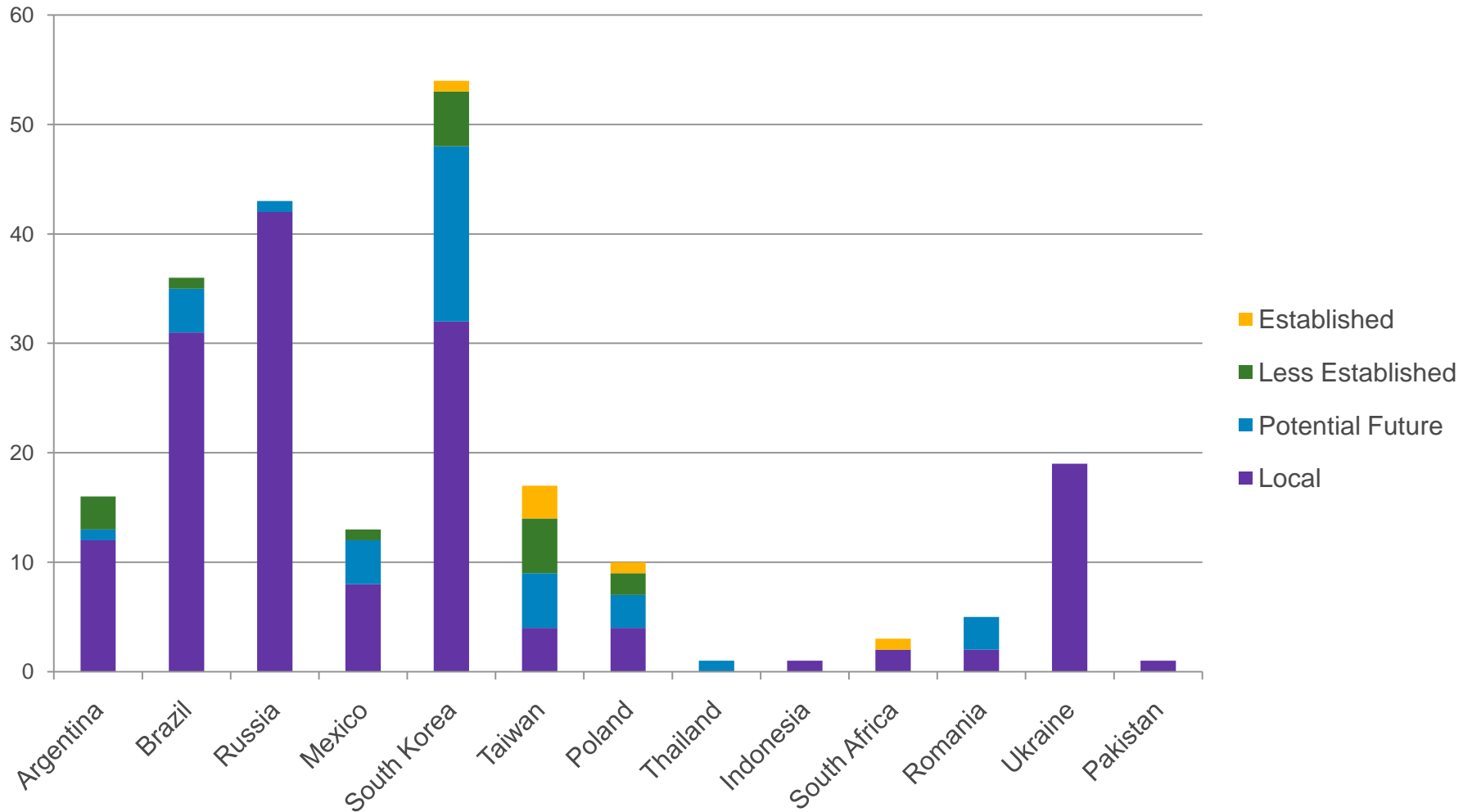
PHARMERGING MARKETS

- Predicted to expand by \$90bn during 2009-2013
- Emerging Markets:
 - Argentina, Poland, Thailand, Indonesia, South Africa, Romania, Ukraine, Pakistan, Mexico, South Korea, Taiwan, Brazil, Russia

Location of API
Manufacturers



PHARMERGING API MANUFACTURERS



FUTURE PROSPECTS SECOND WAVE EMERGING MARKETS

- Many sourcing challenges
- Little experience with regulated markets
- Small API industry
- Limited dose capabilities
 - Some specialties in Argentina (high potency, biologics)
- No indications of significantly better price at acceptable quality than in India or China

FUTURE PROSPECTS - INDIA

- Increased emphasis on FD for regulated markets
- Increased CRAMS business
- Greater reliance on China for APIs and advanced intermediates
- Increased costs as Chinese materials become more expensive and salaries rise
- Increased investment into local market
- Continued emphasis on large batch production

FUTURE PROSPECTS - CHINA

- Strengthened SFDA oversight
- New GMP regulations
- Greater EHS, waste treatment enforcement
- Increased costs of labor
- Improvements in quality, technical packages, IP
- Additional companies will expand into finished dose for regulated markets
- Many companies will stay focused on local market

FUTURE PROSPECTS - EUROPE

- Majority of APIs coming off-patent post 2015 are specialist driven
- Continued investment in process improvements and niche product manufacturing
- EGA proposed regulations to allow stockpiling and export to countries with less IPR
- Continued pricing pressures and competition from India & China

THANK YOU

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