

Twelve Years of Nanotechnology in Mexico (2000 - 2012)

S.NET Presentation: Boston, MA
October 28, 2013

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Overview

- Nano & Mexico
 - Introduction
 - Centers & Labs
 - R&D Funding
 - Research/Publications
 - Commercial/Firms Activities
 - Summary

Nanotechnology in Mexico: Intro

- Second in nano-involvement in Latin America
- No national nano policy, but mentioned in science and technology (S&T) initiatives
 - Special Program of S&T: 2001-06
 - First S&T education and R&D investment policy
 - Special Program of S&T and Innovation: 2008-12
 - Nano one of nine priority areas for S&T development
- \$US 60 million (est.) in public funds: 2005-10
 - CONACYT: National Council of Science & Technology
 - Key funding institution

Nano R&D Funding in Mexico

Main Federal Calls for Projects in Mexico: 2004-2012 Sources, Approved Projects & Nano-Related Projects

Name of the Fund	Time Period	Total Approved	Nano Projects	Nano Share of Total
Totals		10,036	511	5%
CIAM	2004-2012	39	19	49%
FOMIX	2004-2010	356	45	13%
FIC Equipment Support	2009-2012	218	16	7%
Basic Research SEP-CONACYT	2004-2012	5,381	340	6%
Complementary support for SNI I	2006-2011	1,617	61	4%
FORDECyT	2009-2012	71	1	1%
Fondos Sectoriales	~2005-2012	2,304	29	1%
FIC Infrastructure for GMOs	2011	10	0	0%
CIBIOGEM	2005-2013	40	0	0%

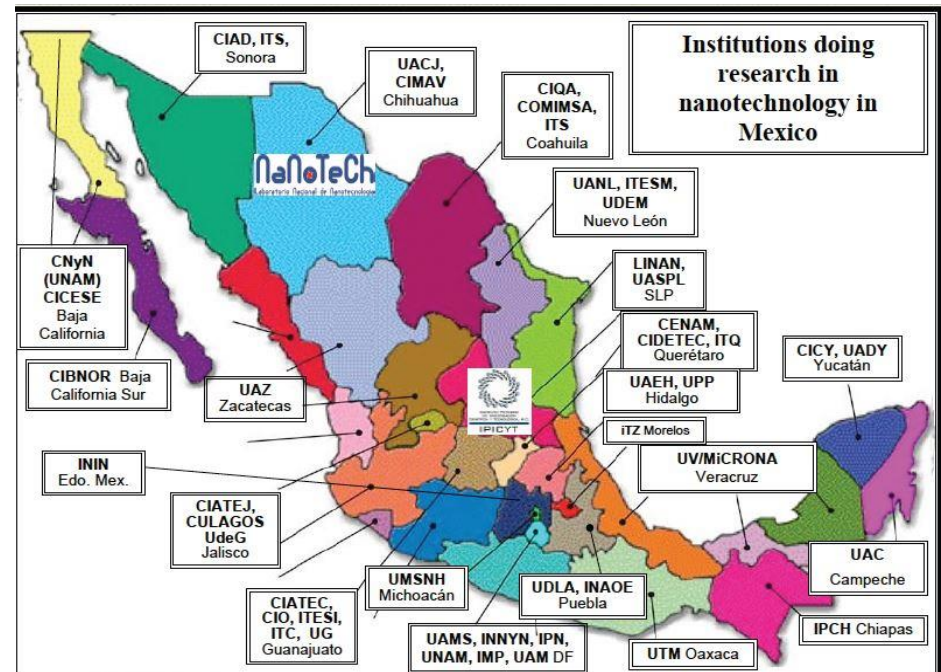
Only one fund made a call explicitly for nano: FOMIX

Data Source: websites of funding sources; searched for nano terms in titles: nano

Nano-Specific Centers & Labs in Mexico

- CONACYT/Public National Labs:
 - Nat'l Nano Labs: est. 2006/08; \$2 mil. each for construction & equipment
 - Advanced Materials Research Center (CIMAV): NaNoTeCH: Chihuahua
 - National “nano” point of contact
 - Institute of S&T Research (IPICyT): LINAN: San Luis Potosí
 - INAOE: National Nanoelectronics Lab (LNN): Puebla (2010)
 - INNN: Nano Lab: Mexico City (2004)
- University-Based
 - UNAM: N&N Center (CNyN): Baja California (2008)
 - IPN: Center for Nano/Micro S&T (CNMN): Mexico City (2009)
 - UV: Micro-Nano Center (Microna): Boco del Rio (2005)

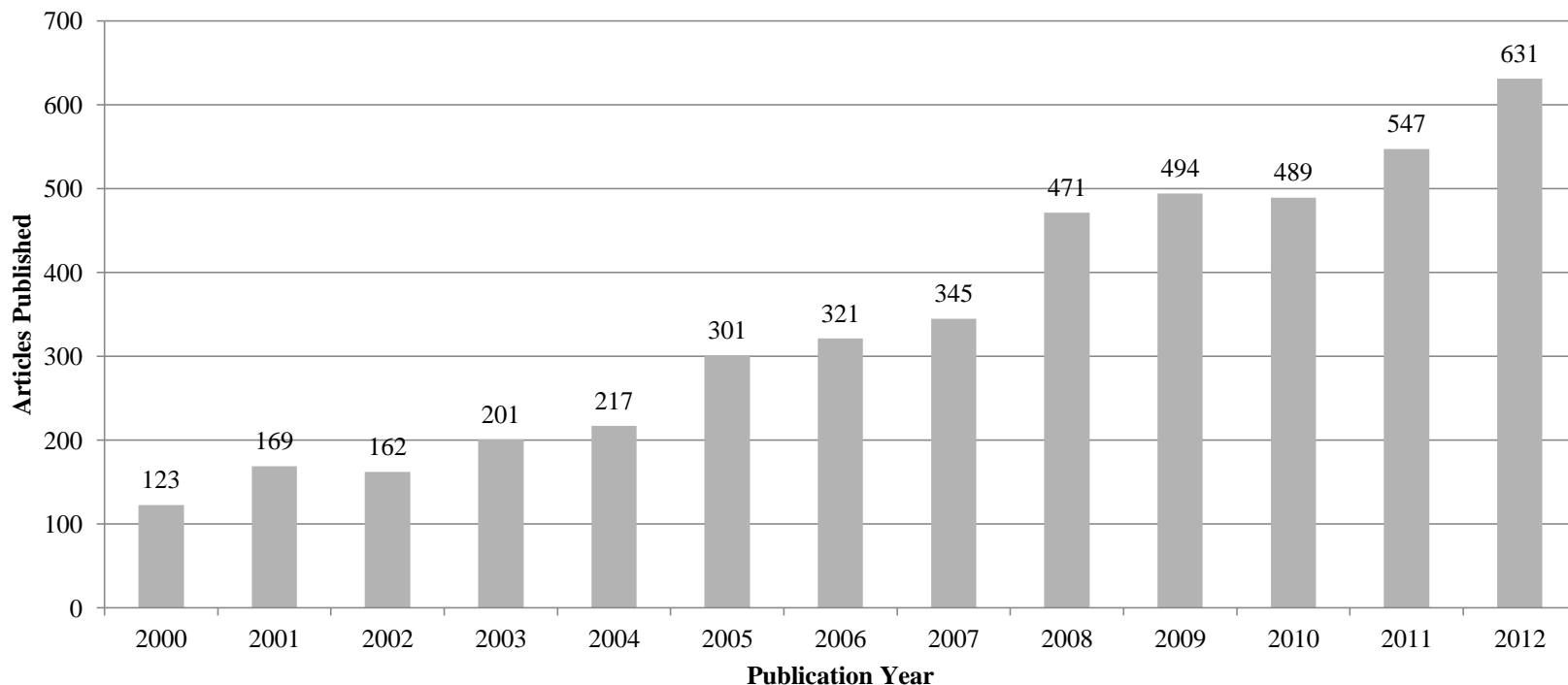
60+ labs and centers engaged in nano R&D



Nanoscience & Nanotechnology Network (Red NyN)

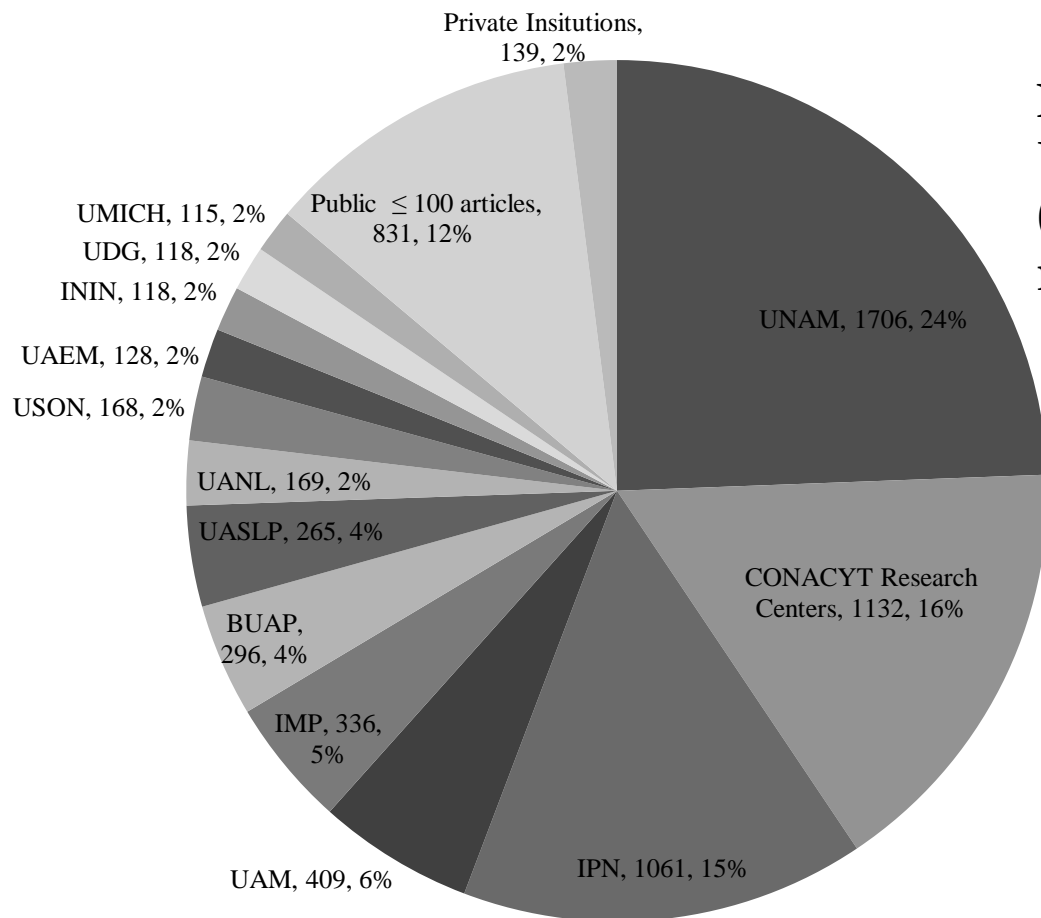
- Est. 2009; network of researchers
- Budget of US \$700,000

Evolution of Nano-Related Publications by Mexican Authors (n = 4,471)



- Significant increase 2008-2012
- 5% of all articles in ISI WOS time frame with author from Mexican institution
- 1% of all nano-related articles using the same search terms

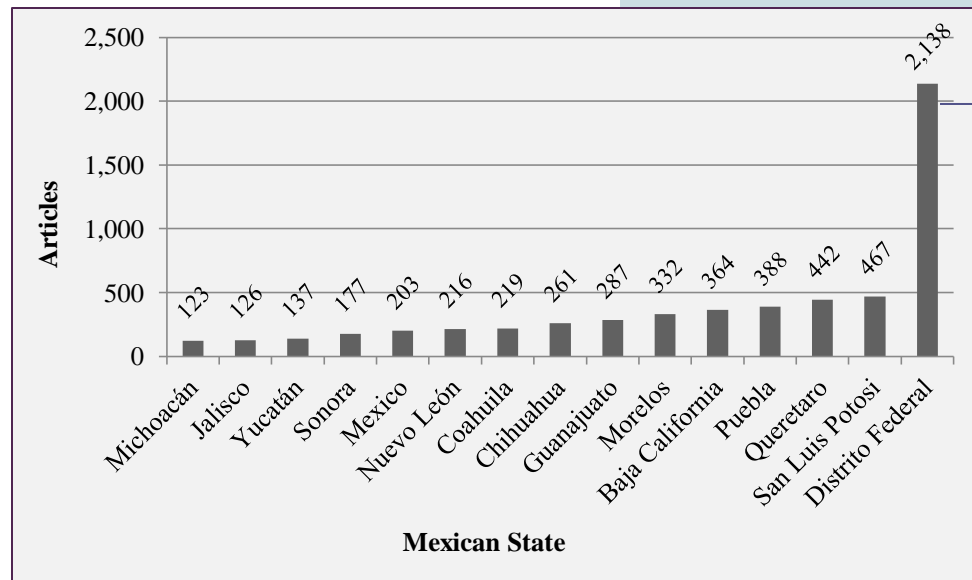
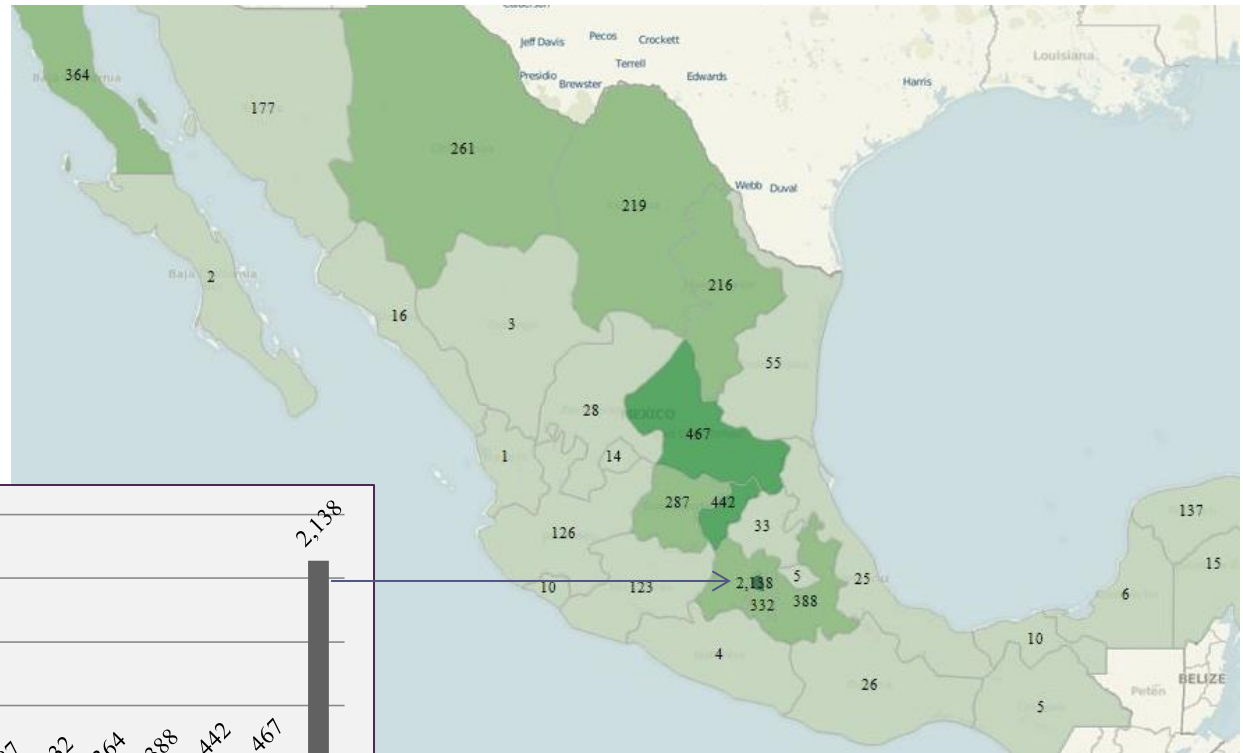
Publication Counts by Main Institutions



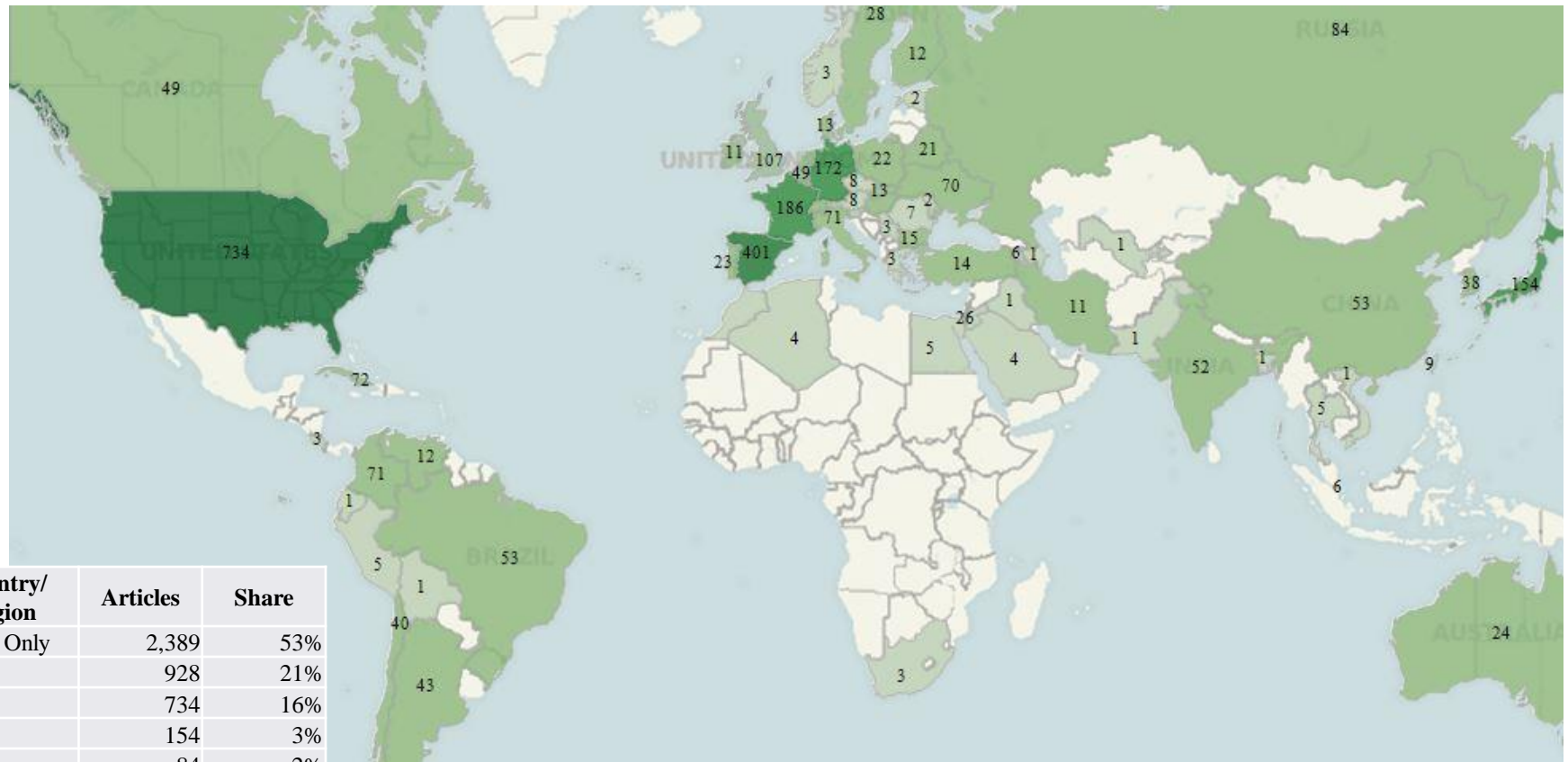
National Autonomous University of Mexico (UNAM) one quarter of research

98% of articles by public institutions

Geographic Distribution of Publications: States



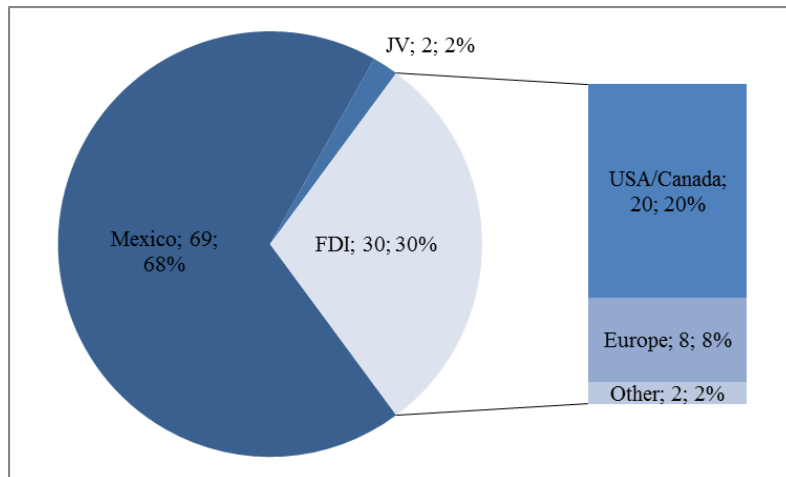
Geographic Distribution: Co-Authors



Country/ Region	Articles	Share
Mexico Only	2,389	53%
EU-15	928	21%
USA	734	16%
Japan	154	3%
Russia	84	2%
Cuba	72	2%
Colombia	71	2%
Ukraine	70	2%
Total	4,471	

Nano-Related Firms in Mexico: Geography & Ownership

- 101 firms
- Majority (68%) domestic firms
- Geographic concentrations in Nuevo Leon & Mexico City



Distribution of Firms by Ownership



Nuevo León

- Research & Technological Innovation Park (PIIT): Monterrey, Nuevo León
 - Industry, government & academia
 - Nano Cluster of Nuevo Leon (CNNL)(est. 2008)
 - Specialized incubator for nanotechnology
 - 30+ companies
 - Funded by CONACYT & Nuevo Leon State Government
 - Mixed Funds (FOMIX) program
 - 19 nano-specific linkage projects (2001-12)
 - \$82 million

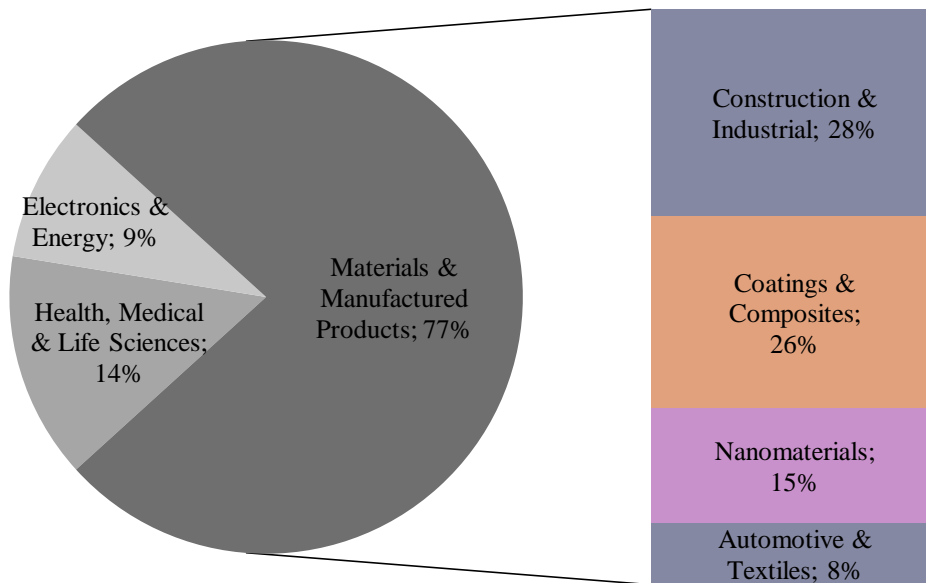


mtynano cluster

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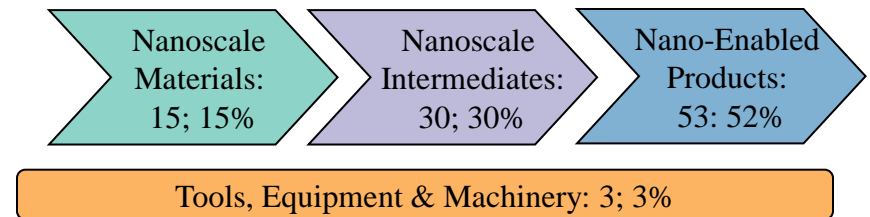
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Nano-Related Firms in Mexico: Activities



Primary Industry Sectors & Leading Value Chain Sectors

- Majority of firms in materials & manufactured products



Number of Firms & Share of Total by Value Chain Stage

- Largest share of firms in final products (52%)
- Most appear to be engaged in manufacturing; at least 10% engaged in research, distribution or service only

Summary

- **National Policy & Funding**
 - S&T as a priority area relatively new (~10 years)
 - Nano as a strategic path more recent (~5 years)
 - No nano-specific initiative; estimated ~5% of R&D projects
- **Research Centers & Publications**
 - Over 60 research centers with some nano-research activity
 - Over 50% of research literature from three groups (UNAM, CONACYT & IPN)
 - Geographic concentration around Mexico City
 - Minimal private sector participation
- **Commercial Activities**
 - 100+ firms identified
 - Largest share in materials/industrial-related goods
 - Mix of foreign and domestic ownership
 - Centralized in Nuevo León & Mexico City

Thank you



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