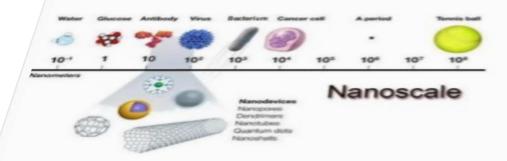
## NANOTECHNOLOGY IN INDUSTRIES

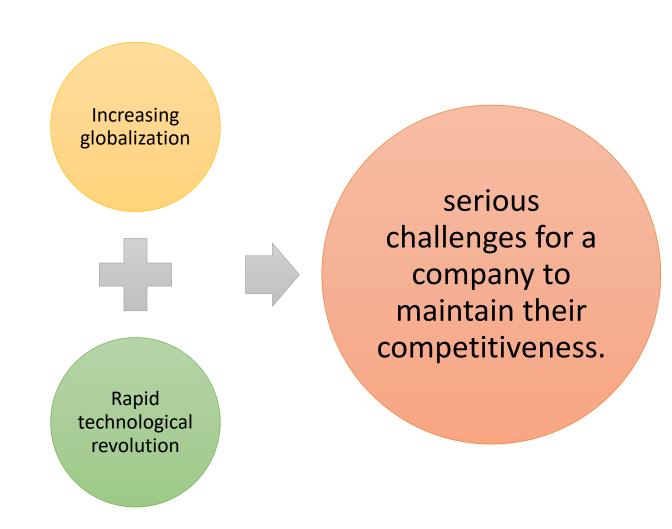




# Chain of nanotechnology application cycle in industry

# **Problem:**

• Competitiveness:



SMEs need to be more competitive

Improving productivity

Introducing new and innovative products

Reducing environmental impact

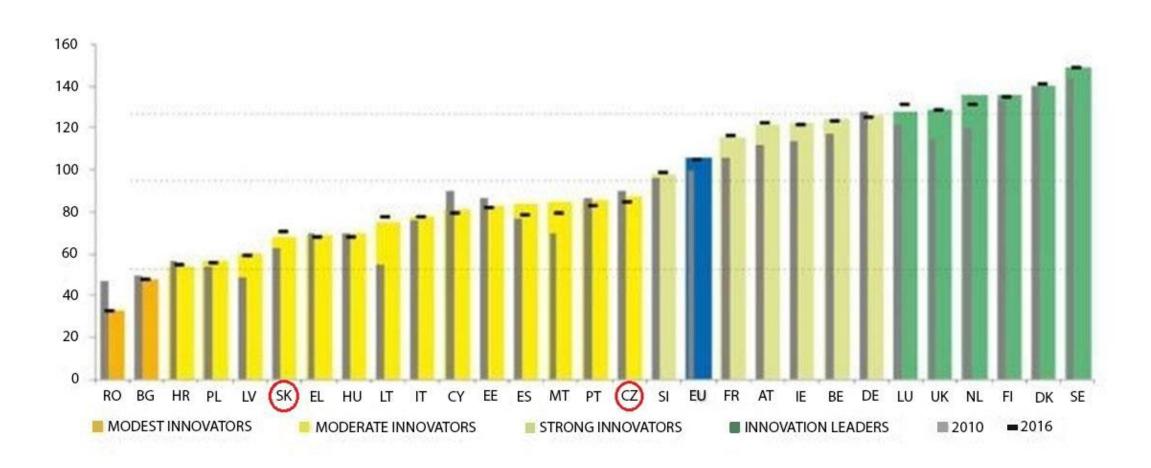
# **Solution:**

Develops solutions to major social issues.

Innovation is considered as the new competitive weapon

Boosts economic growth and creates jobs.

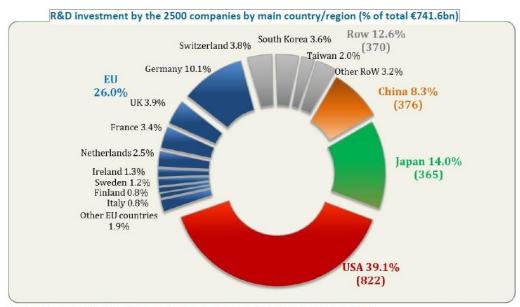
## Innovation performance of the EU Member States



About two-thirds of Europe's economic growth over the last decades has been driven by innovation.

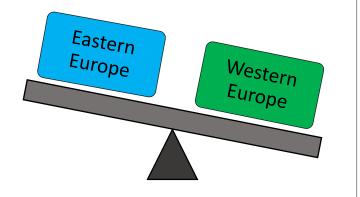


# Europe accounts for 26% of global R&D investment.



Source: The 2017EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG RTD.

R&D intensity is uneven among EU regions.



## Innovation through Key Enabling Technologies (KET)

KET's form the basis of the Horizon 2020 program

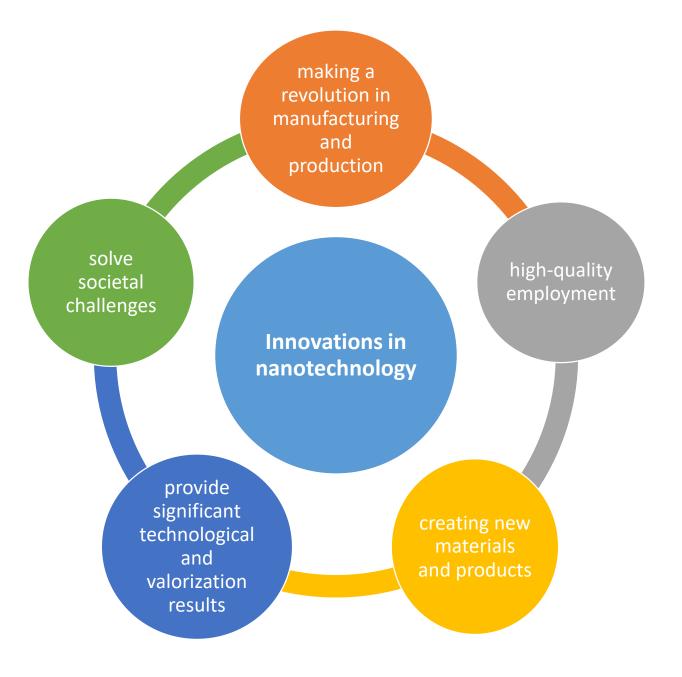
They will make **EU** industries more globally competitive

They will provide new options to address present and future Key Societal Challenges

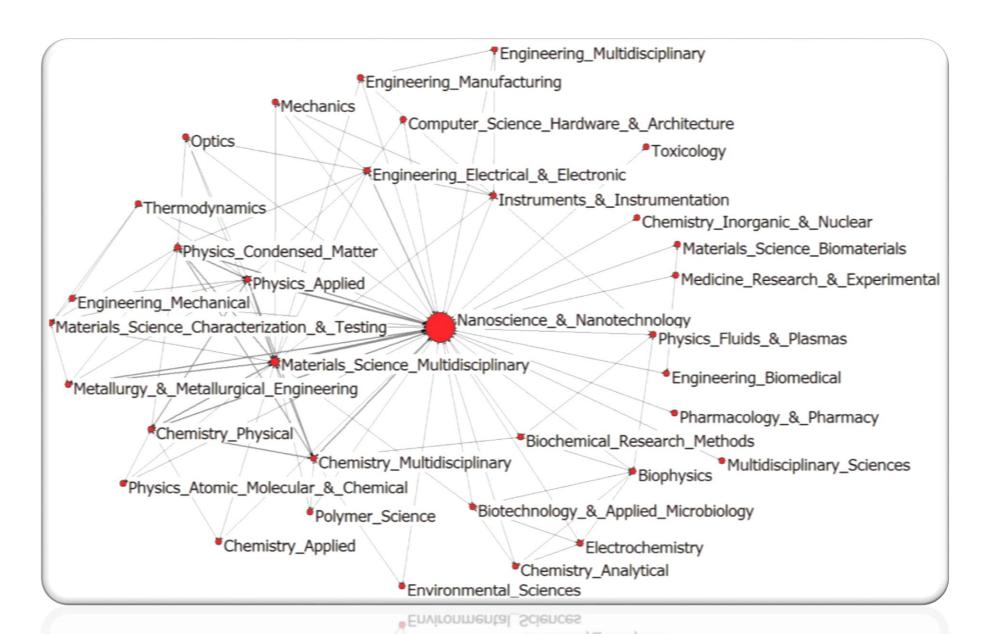
## **Key Enabling Technologies** Advanced manufacturing systems Climate action, resource efficiency, and raw materials · Secure, clean and efficient energy · Food security, sustainable agriculture, marine and maritime research and the bio-· Health, demographic change and wellbeing · Inclusive, innovative and secure societies · Smart, green and integrated transport

The European Commission has selected Nanotechnology and closely related Micro and nanoelectronics as two of its six "Key Enabling Technologies".

It is generally considered to drive innovations in the 21st century

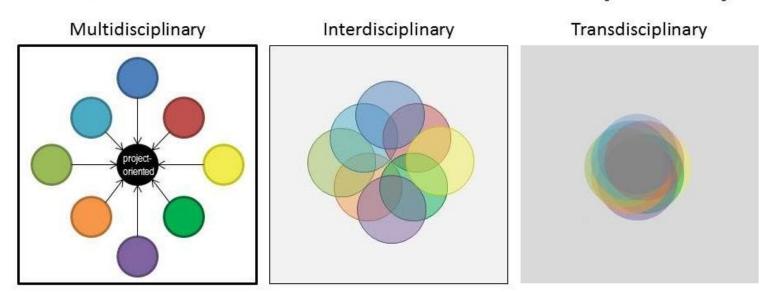


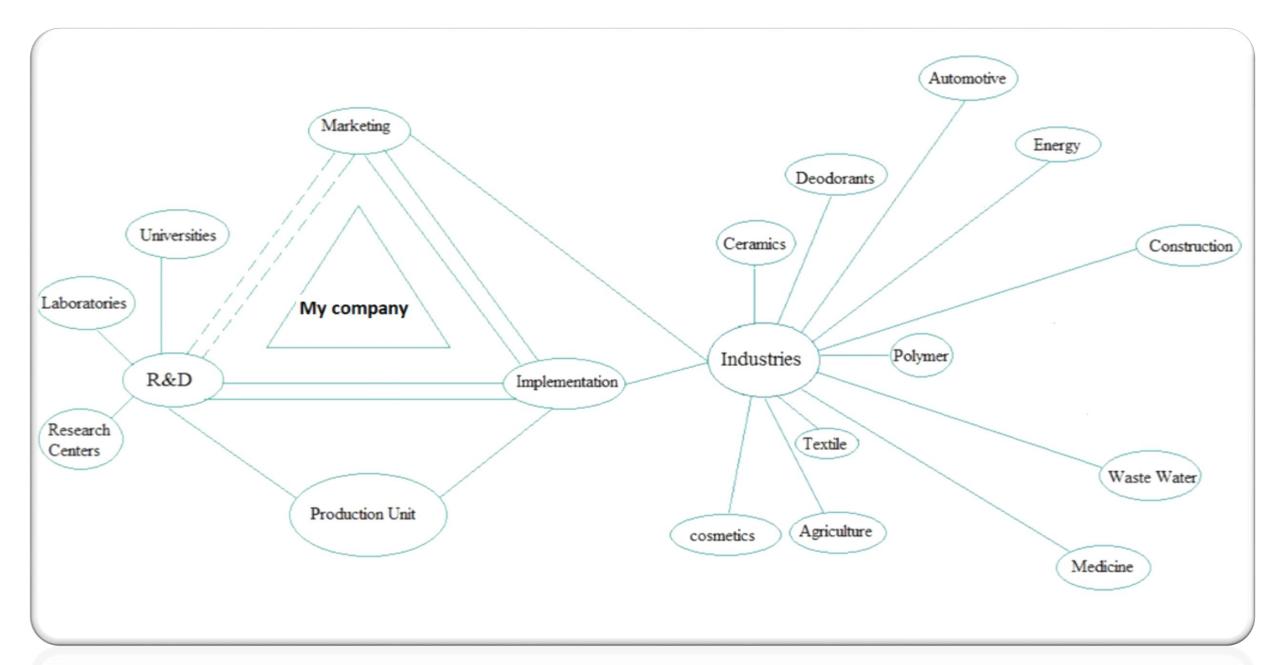
#### Nanotechnology: a general-purpose technology to reach mass use by 2020



- Not only is nanotechnology a multidisciplinary technology, but also we can refer to it as an interdisciplinary technology.
- For sure, it will become a **transdisciplinary technology** in near future.
- It will become an indispensable part of any industries.

## Multi- → Inter- → Transdisciplinary





We benefit from nanotechnology to:

- 1. create final products with unique characteristics.
- 2. solve societal and environmental challenges such as health, waste water, etc.
- 3. provide industries with superior plant competitive advantage.

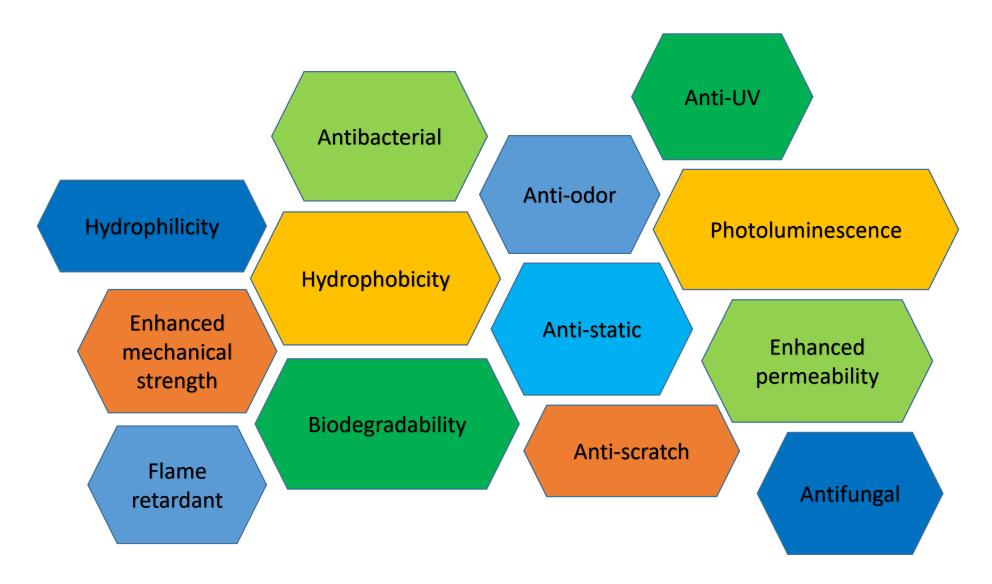
# Our products and services:

For any industrial unit, we define projects with the help of nanotechnology to:

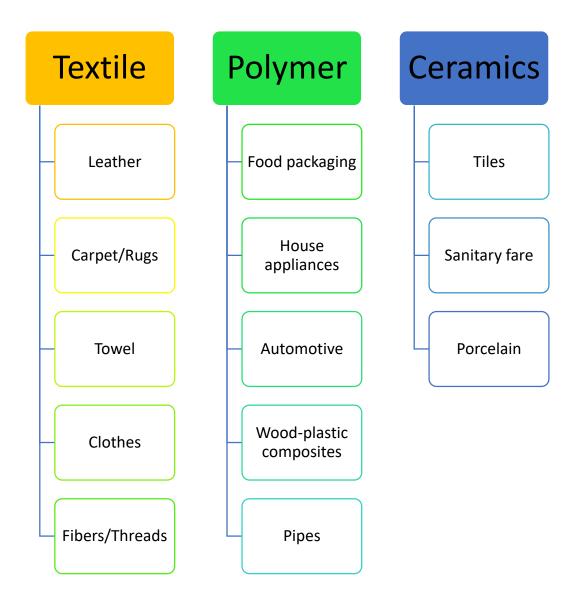
- gain final products with novel or enhanced characteristics.
- solve existing challenges and issues.

We define projects associated with nanotechnology We produce nanomaterials based on the defined projects We feed the projects with the produced nanomaterials

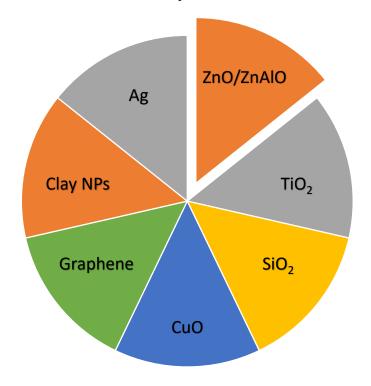
#### So far we have worked on the following features:



#### In the following industries:



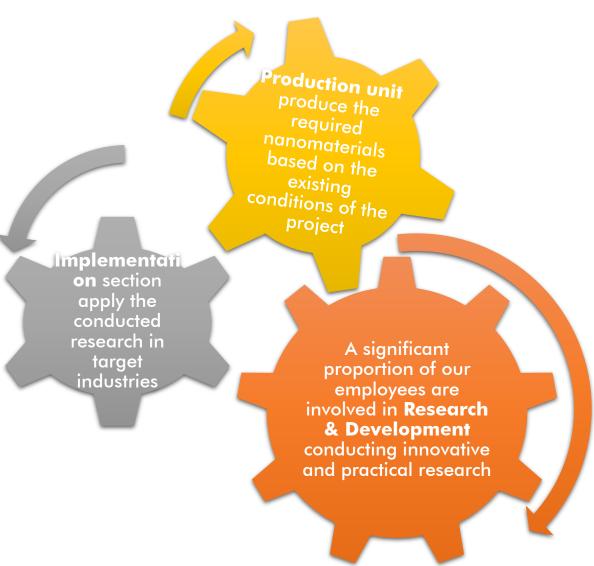
To fulfill our projects' goals, we have produced the following nanomaterials:



The produced nanomaterials may have different codes which refer to the difference in their characteristics due to an intentional change in the synthesis routes or synthesis conditions.

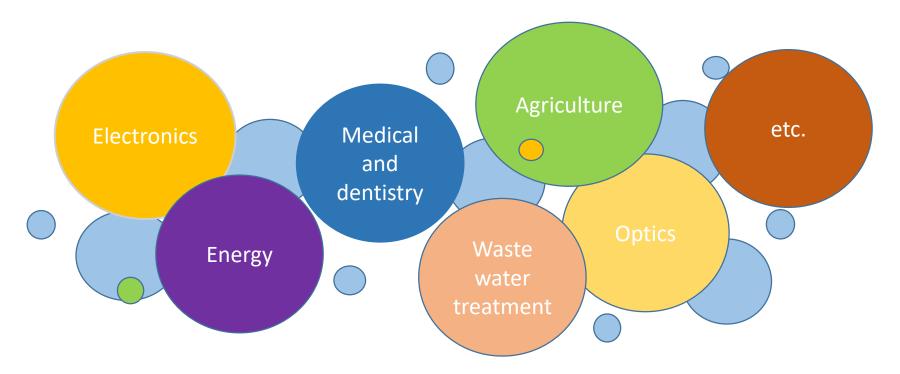
## What makes us stand out?

- What makes us unique is our experience and ability to make the idea into reality.
- With the help of Marketing section, the projects are provided and planned. The other sections try their best to reach the desired outcomes



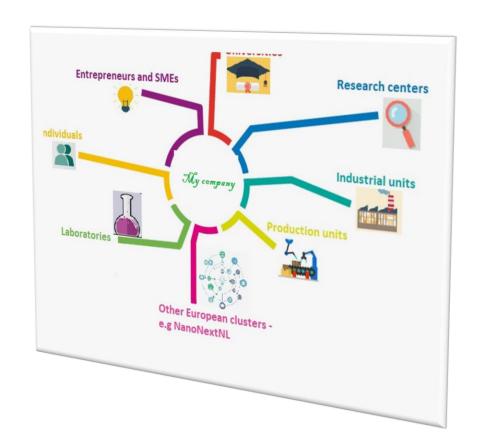
# **Our Perspective:**

We are determined to penetrate into other industries with priorities of societal and environmental challenges and those in demand.



We are completely aware that this cannot happen as an individual firm.

### Therefore, we aim at becoming a cluster:



# How to start?

# Business trajectory:

• ZnO NPs

- TiO<sub>2</sub> NPs
- SiO<sub>2</sub> NPs
- CuO NPs
- Graphene Nano-sheets
- Clay NPs
- Ag Nano-cloids

Start a production unit

Start contacting potential customers, simultaneously

- Companies working in the fields of Textile,
  Polymer, Ceramics
- In order to enhance their products with characteristics mentioned in slide 16.

 To enhance a part or all of their production volume with the produced nanomaterials.

Making a contract with customers

Selling the nanomaterials

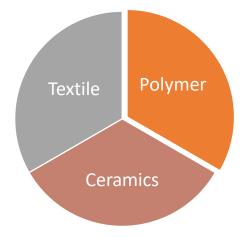
 Monthly or every two months based on the request or the nanomaterials life-time.

- We will work on the incoming projects based on demand parallel to the previous.
- We will attribute specific contract for each step including R&D, tests etc.

Working on incoming projects

## Market:

• In the beginning any company working in the fields of:



- It would be good to note that only for antibacterial, antifungal and anti-odor properties, the majority of the selected nanomaterials consists of ZnO nanoparticles, also known as zinc white.
- The global export rate of this product, with HS code 381210, is highly interesting.

#### The global export rate of product coded as 381210 (1000\$)

Global export	2012	2013	2014	2015	2016	2017
Global	576,814	691,531	836,032	762,835	728,036	842,050

Based on the statistics provided by the Chamber of Commerce, Industries, Mines and Agriculture of Iran, the pioneering countries in exporting this material are given below. It is needless to mention that the value of export is noticeable.

The export rate of product 381210 from pioneering exporting companies (1000\$)

Country	2012	2013	2014	2015	2016	2017
China	185,691	280,961	421,052	379,474	348,773	418,245
Germany	53,151	56,989	64,135	55,686	58,277	64,608
The US	44,877	53,852	59,997	60,080	61,068	64,233
Italy	26,693	30,500	32,591	25,708	28,538	50,454
Malaysia	22,071	22,849	28,089	32,104	36,285	34,241

# Investing:

Obviously, every start-up needs investment to grow.



