cost
EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

Funded by the Horizon 2020 Framework Programme of the European Union

Textiles in Automotive and Aeronautics

context

1st CONFERENCE

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Barcelona

31st January 2019

Cost Action
CA17107

SOCIETAL CHALLENGES FOR MOBILITY

Climatic changes

Higher level of CO2 over de last 650 000 years.

Global temperature increased 1,8°C since 1880.

Sea water level increased 3,2 mm.

Green transportation

50% of the overall polution comes from transports

Low carbon economy

Nº of electric vehicules projected to increase from 3,1 M in 2017 to125 M in 2030.

Demographic rise

Population will reach 10 billion in 2100 (in 1950, ~ 2,5 billions).

Healthy ageing

Global population> 80 years will increase from 137 millions in 2017, to 909 millions in 2100.

Smart cities

95% of accidents due to human errors.

In 2015, 1,25 million deaths due to car crashes.

Urban mobility

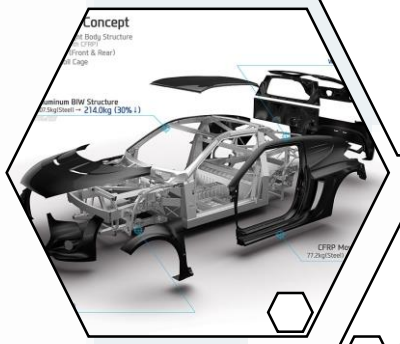
In 2050, 70% of the human population well live in cities

TRENDS IN MOBILITY

INNOVATION TREENDS

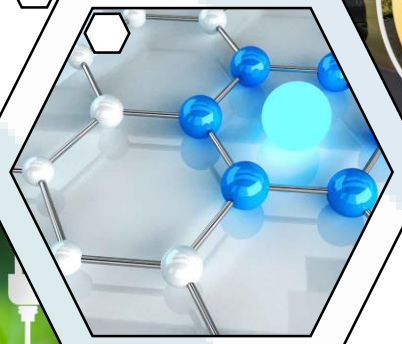
MULTIFUNCTIONALITY

CIRCULAR ECONOMY



DURABILITY

SUSTAINABILITY



WEIGHT REDUCTION

COMPETITIVENESS

PERFORMANCE

FLEXIBILITY

conte

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INNOVATION TRENDS

WEIGHT REDUCTION

•10% reduction on weight corresponds to 5-7% in combustible safe

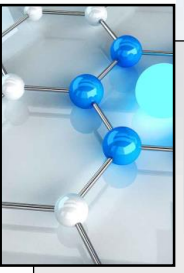
SUSTAINABILITY

• transport systems accounts for 36,9% of the overal energy consumption.

• 40% reduction of gas emmissions till 2030.

MULTIFUNCTIONALITY

•Smart, interactive, authonomy, safety, connectivity



DURABILITY

• Corrosion, fatigue, cyclic load

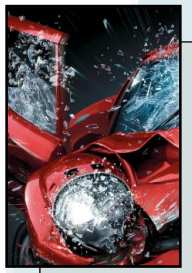
CIRCULAR ECONOMY

• Decrease the production of waste

• Renewable energy and biodegradable materials.

COMPETITIVENESS

• Costs, legislation



PERFORMANCE

• Mechanical performance

FLEXIBILITY

• Combination of different types of materials

• Product design

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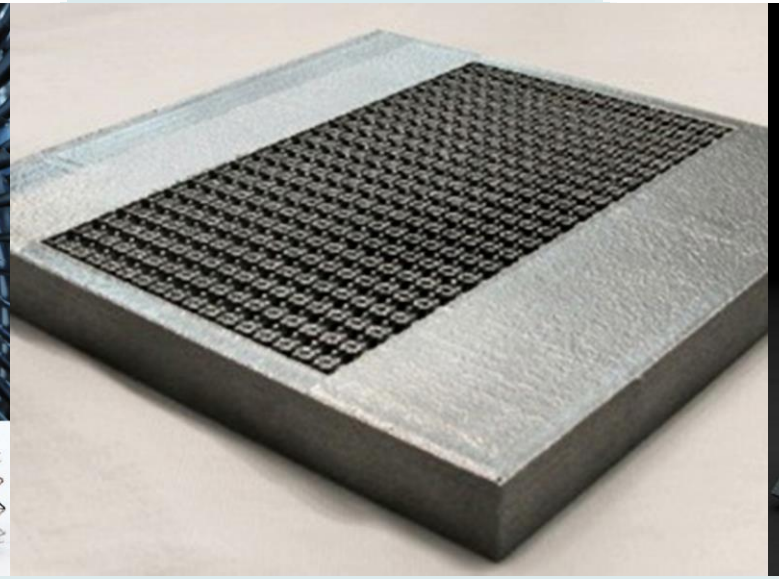
MARKET TRENDS

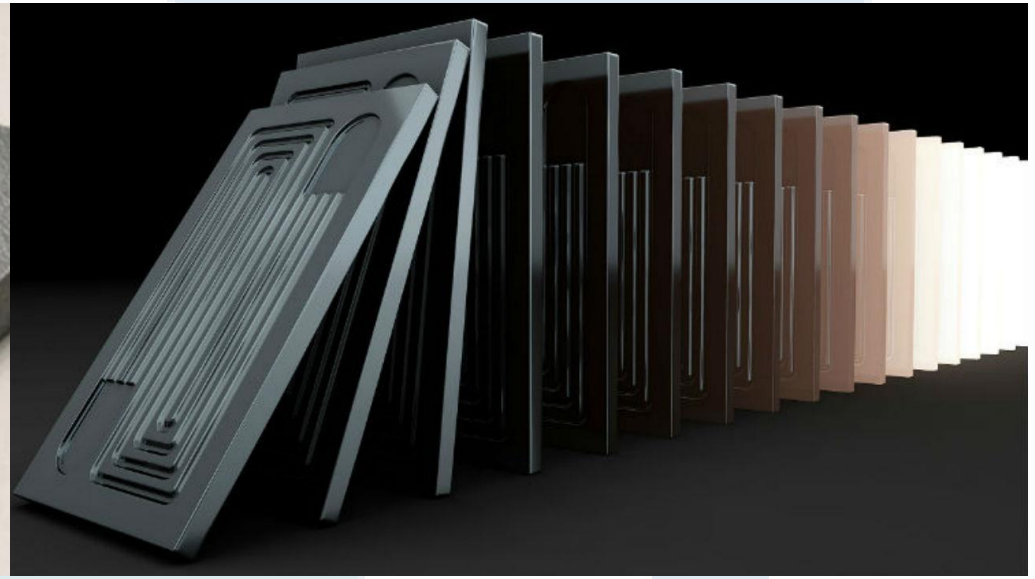
"Composite materials in automotive industry will reach $11,26 billions in 2020, with 12,94% increase between 2015 and 2020.

PMC
Polymeric matrix composites

MMC
Metal matrix composites



CMC
Ceramic matrix composites



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Source: Markets and Markets

MARKET TRENDS

“Natural fiber reinforced composites will reach $6,50 billions in 2021, with 11,68% increase between 2016 and 2021.”

BMW i3

Kenaf fiber

Lotus Eco Elise

Hemp fiber

Biofore

Wood fiber

context

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FSource: Markets and Markets

MARKET TRENDS

"Carbon fiber based materials will increase from $2,86 billions in 2017, to $6,10 billions in 2023."

30% waste over the overall production process

Recycled carbon fibers

BMW i3

BMW

Fonte: Mordor Intelligence

Source: Markets and Markets

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SUSTAINABILITY
(Circular Economy)
eco-design, biomimetics, waste, ecomaterials

SMART
adaptability

ECO
sustainability

NANO
performance

Well-being	Safety	Resources
Health	Personnel	Air/Water
Sports	Mobility	Energy
Active ageing	Infrastructures	Bioresources

Fiber based materials

Composite materials

Multifunctional

Multiscale

Multimaterial

DIGITALIZATION
(Digital Economy)
connectivity, iinteractivity, dematerialization

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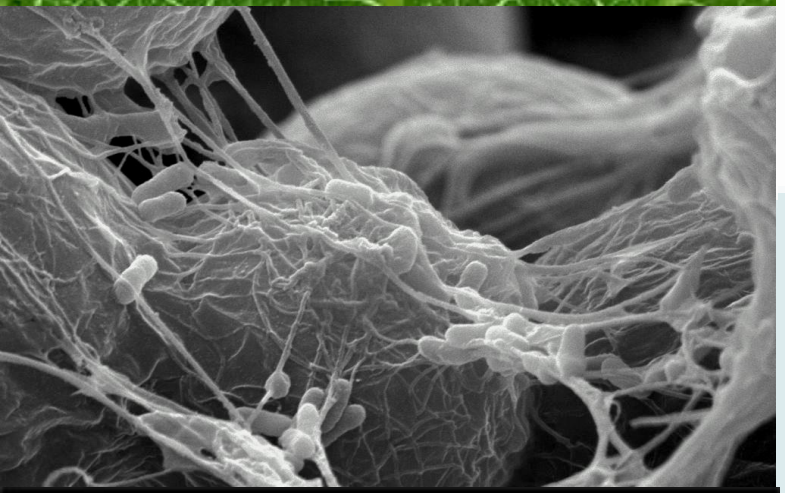
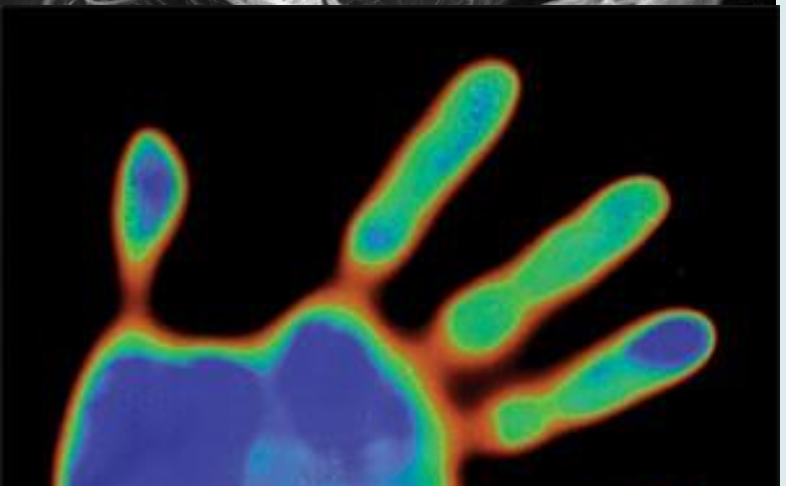
ECO

SUSTAINABILITY



NANO

PERFORMANCE



SMART

ADAPTABILITY

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BIOPOLYMERS

NANOCELLULOSE

NATURAL FIBERS

WASTE (circular economy)

Market:

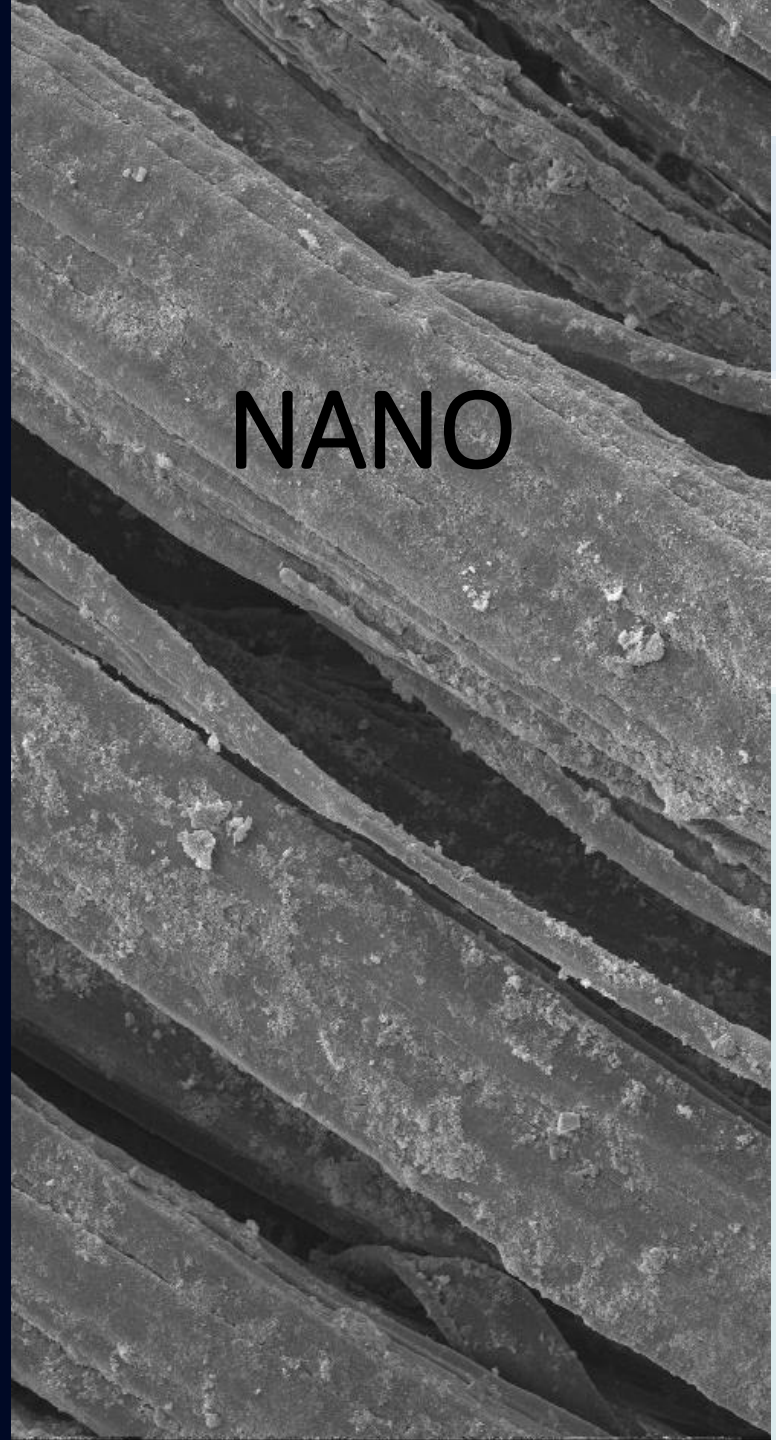
1 Billion euros till 2024 (Global Market Insight)

Applications:

Food packing, cosmetics, medical devices, absortion systems, biocomposites, filters,....

Properties/Characteristics :

Light, transparent, high absortion capacity, higher tensile strength than steel, stiffer than kevlar, non-toxic, abundant polymer and renewable



CARBON NANOTUBES

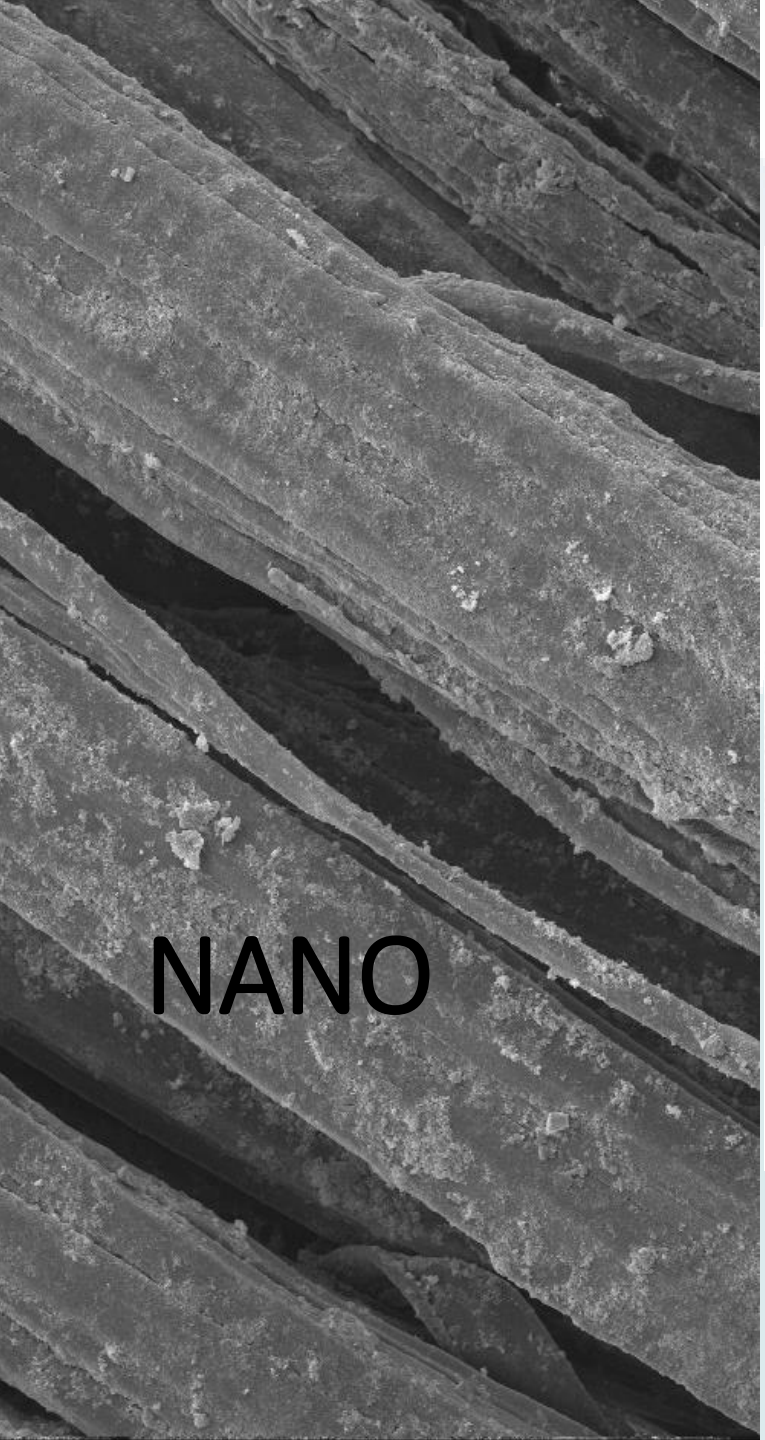
high strength, high thermal and electrical conductivity

GRAPHENE

the strongest material

NANOFIBRAS

high ratio area/volume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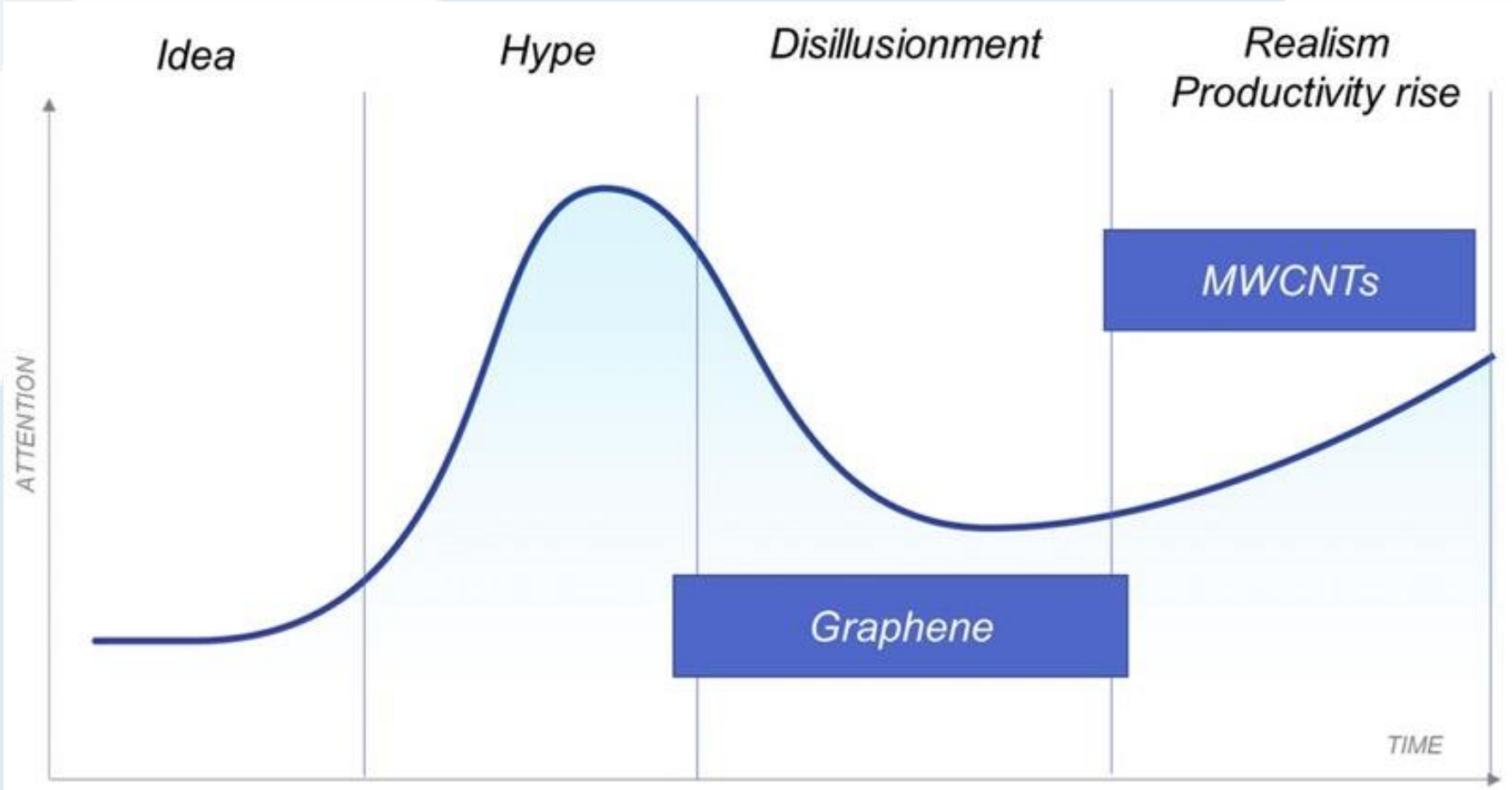
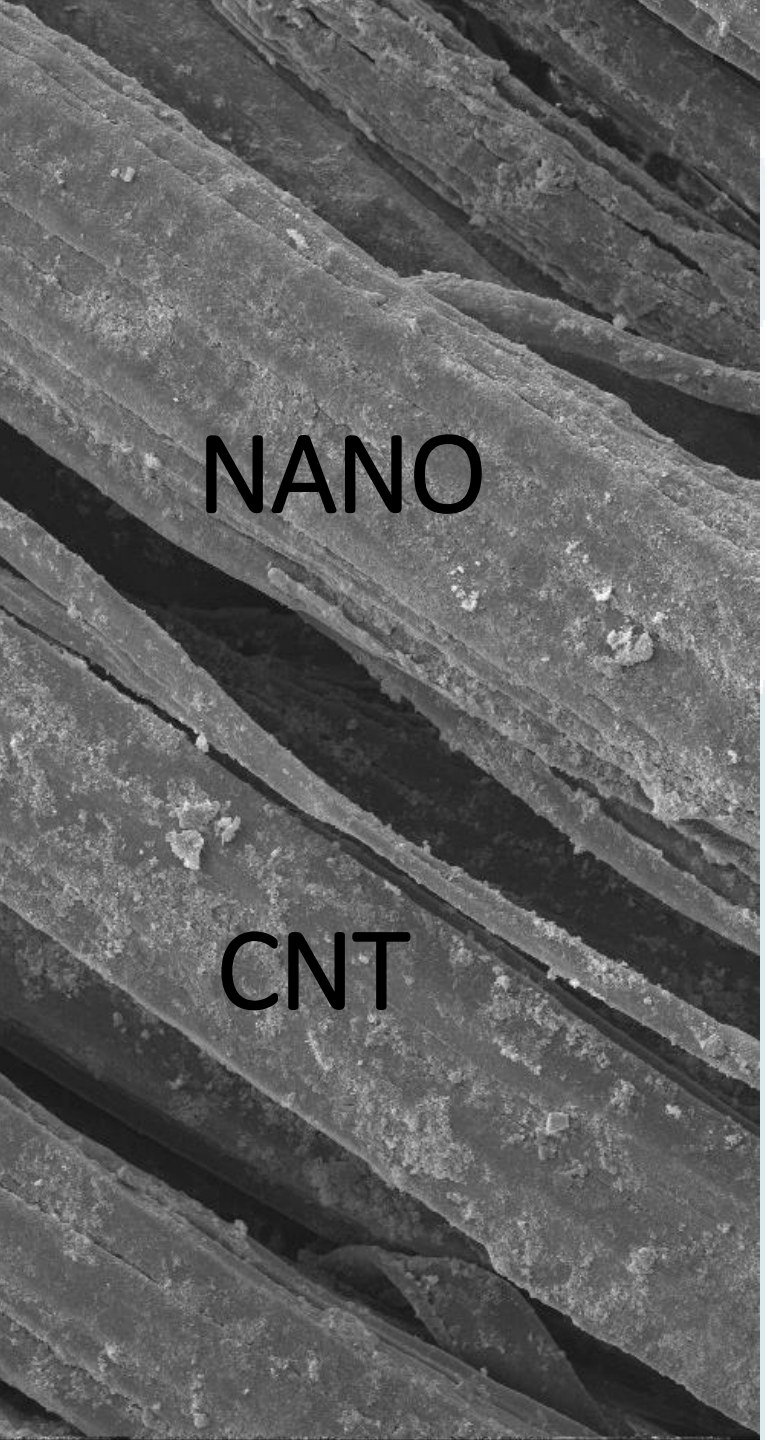

Idea
Hype
Disillusionment
Realism
Productivity rise
ATTENTION
MWCNTs
Graphene
TIME

IDTechEx



Market:

8,7 billion euros to 2022 (Markets&Markets)

Applications:

Composites, smart textiles, energy storage, coatings, sensors,....

Properties/Characteristics :

High electrical conductivity, tensile stress highr 100x than steel, youg´s modulus higher 5x than steel, low density (1,3 g/cm^3)

SELFHEALING

THERMORREGULATORS

CHROMOTROPIC

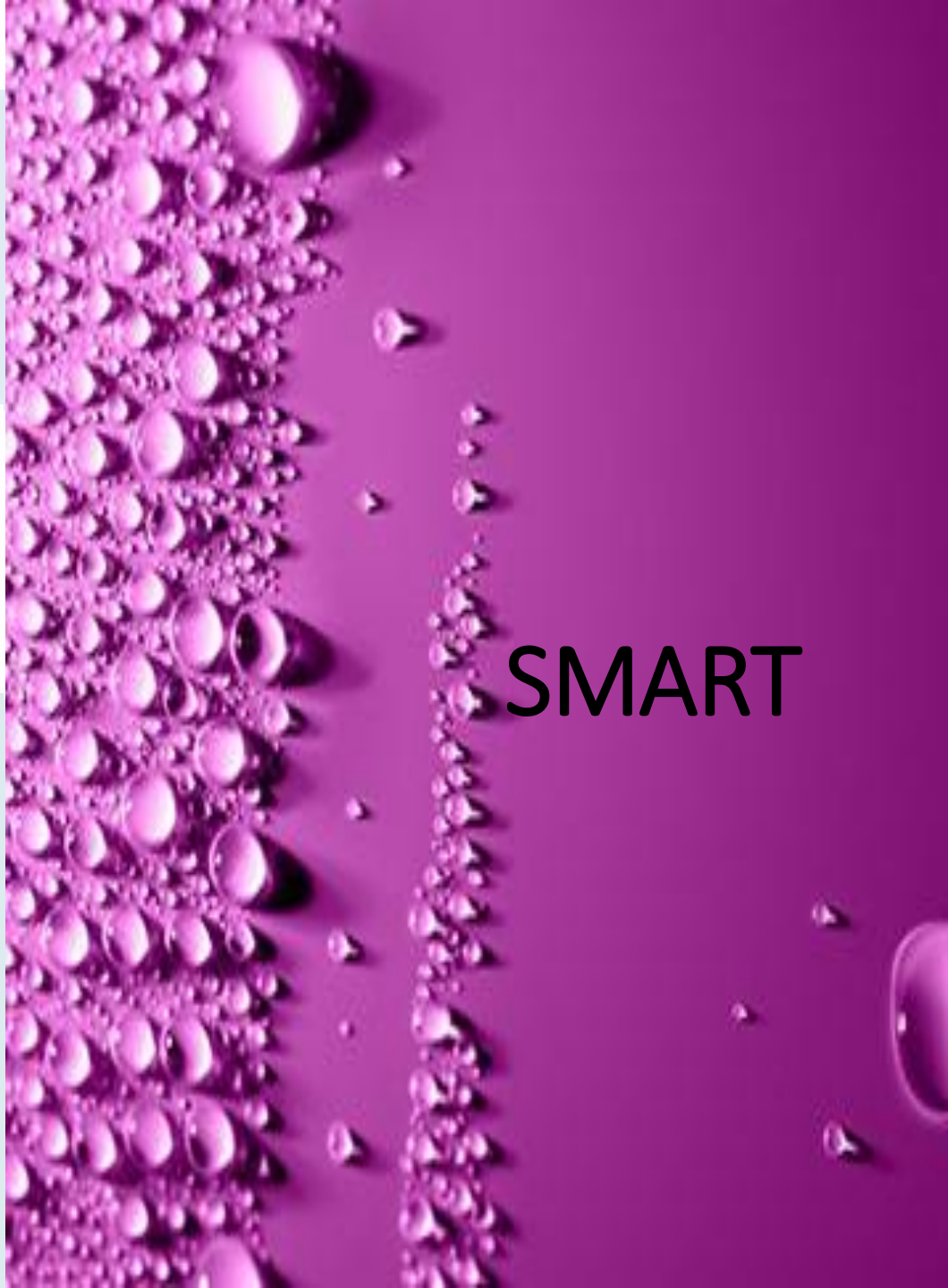
PIEZOELECTRICS

OPTOELETRONICS

PHASE CHANGE

SHAPE MEMORY

...



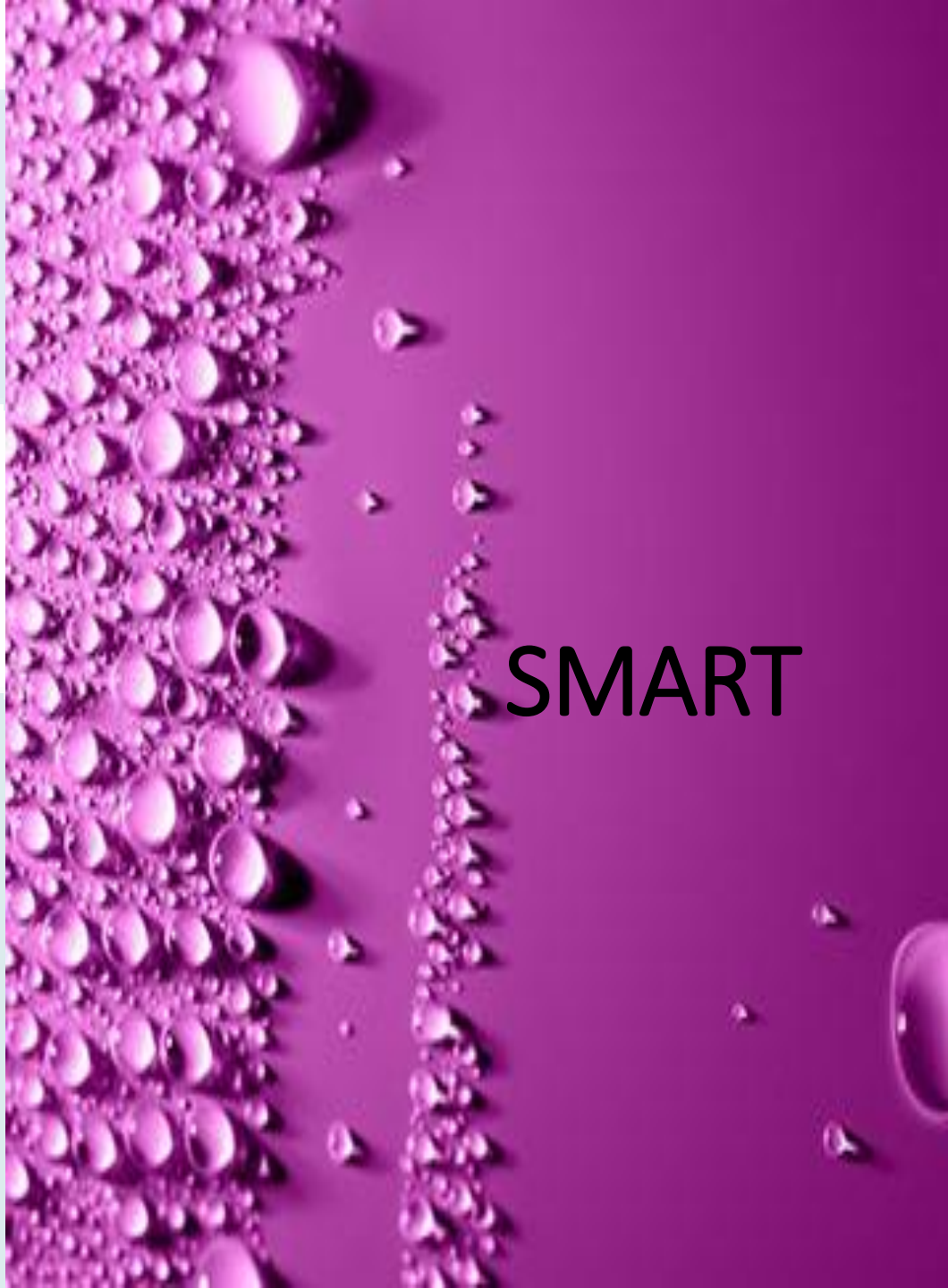
SMART

Market:

98,2 billion euros to 2025 (GrandViewSearch)

Trends:

- Piezoelectrics with higher growth;
- Shape memory with growth in stents, dentary, prothesis, medical textiles and surgical fixation devices....
- Adpative materials for structural monitoring and sustainable buildings Materiais adaptativos para monitorização estrutural e edifícios sustentáveis
- Smart textiles: health, sports and protection



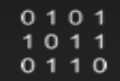
Emerging Technologies

#1 Artificial Intelligence
AI /Machine Learning / Deep Learning

#2 Internet of Things
IOT , IIOT, Sensors & Wearables

#3 Mobile/Social Internet
Advancements - Search/Social/ Messenging/Livestreams

#4 Blockchain
Distributed Ledger Systems, Cryptocurrencies & DApps



#5 Big Data
Apps, Infrastructure, Technologies + Predictive Analytics

#6 Automation
Information, Task, Process, Machine, Decision & Action

#7 Robots
Cons./Comm./Indus., Robots, Drones & Autonomous Vehicles

#8 Immersive Media
- #VR/ #AR/ #MR/ 360°/ Video?Gaming

#9 Mobile Technologies
Infrastructure, networks, standards, services & devices

#10 Cloud Computing,
SaaS, IaaS, PaaS & MESH Apps

#11 3D Printing
Additive Manufacturing & Rapid Prototyping

#12 CX
Customer Journey, Experience Commerce & Personalization

#13 EnergyTech
Efficiency, Energy Storage & Decentralized Grid

#14 Cybersecurity
Security, Intelligence Detection, Remediation & Adaptation

#15 Voice Assistants
Interfaces, Chatbots & Natural Language Processing

#16 Nanotechnology
Computing, Medicine, Machines + Smart Dust

#17 Collaborative Tech.
Crowd, Sharing, Workplace & Open Source Platforms & Tools

#18 Health Tech.
Advanced Genomics, Bionics & Health Care Tech.

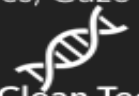
#19 Human-Computer Interaction
Facial/Gesture Recognition, Biometrics, Gaze Tracking

#20 Geo-spatial Tech.
GIS, GPS, Mapping & Remote Sensing, Scanning, Navigation

#21 Advanced Materials
Composites, Alloys, Polymers, Biomimicry, Nanomanufacturing

#22 New Touch Interfaces
Touch Screens, Haptics, 3D Touch, Paper, Feedback & Exoskeletons

#23 Wireless Power



#24 Clean Tech.
Bio-/Enviro-Materials + Solutions, Sustainability, Treatment & Efficiency

#25 Quantum Computing
+ Exascale Computing

#26 Smart Cities
+ Infrastructure & Transport

#27 Edge/Computing
+ Fog Computing

#28 Faster, Better Internet
Broadband incl. Fiber, 5G, Li-Fi , LPN and LoRa

#29 Proximity Tech
Beacons, .RFID, Wi-Fi, Near-Field Communications & Geofencing

#30 New Screens
TVs, Digital Signage, OOH, MicroLEDS & Projections

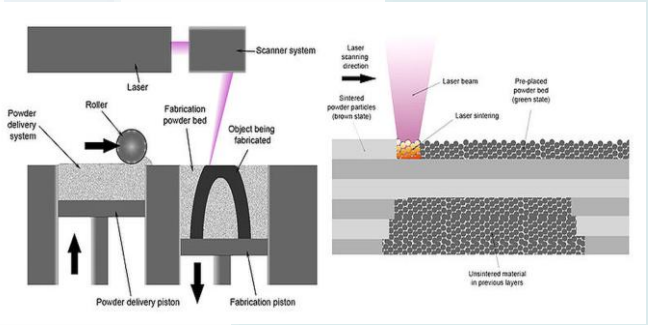
THE 30 TECHNOLOGIES OF THE NEXT DECADE

Created by: Sean Moffitt @seanmoffitt , Managing Director, @Wikibrands

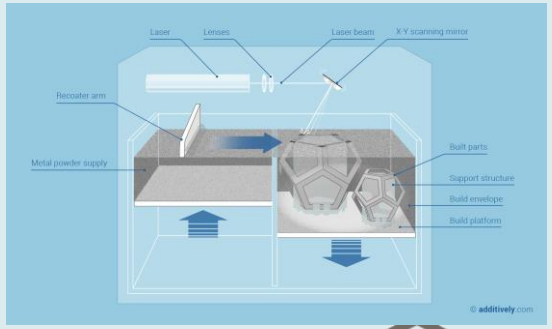
WIKIBRANDS

ADDITIVE MANUFACTURING

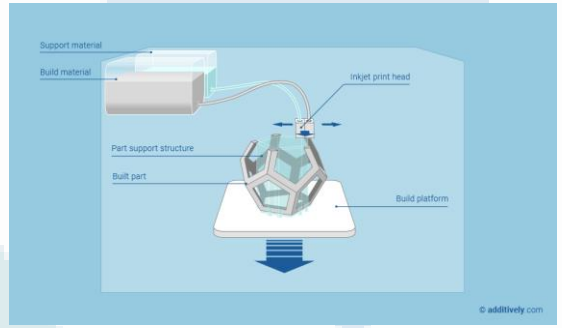
SLS
Selective Laser Sintering



SLM
Selective Laser Melting



MJ
Material Jetting



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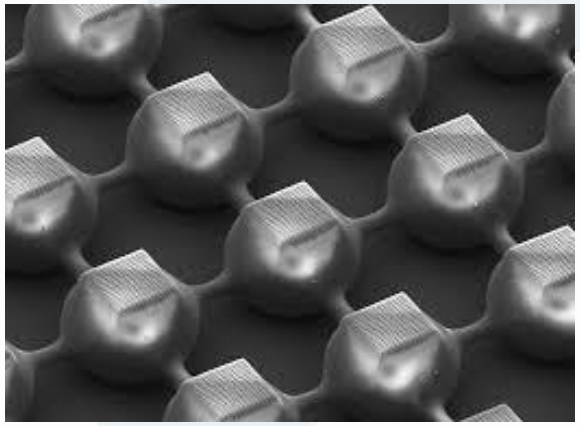
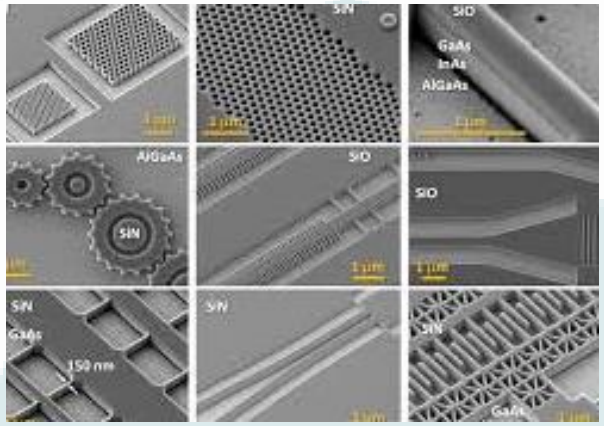
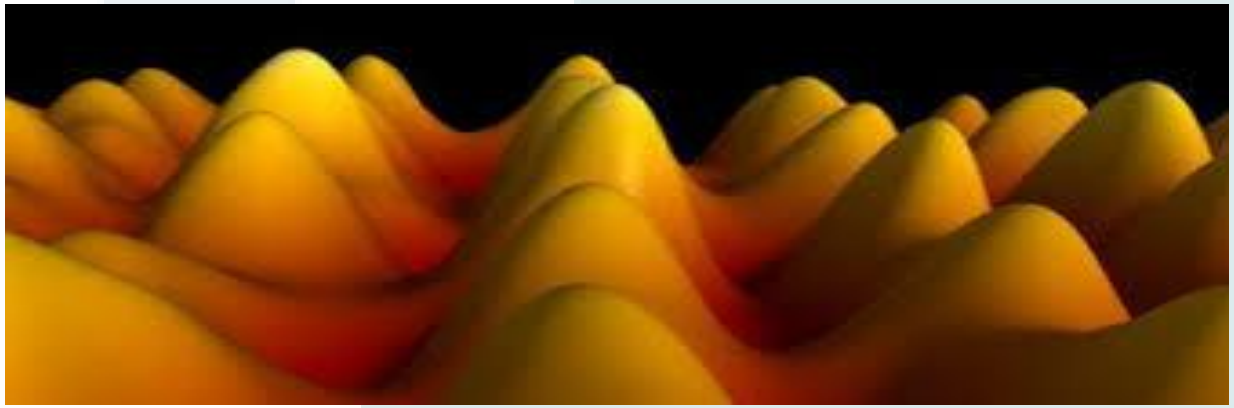
NANOFABRICATION







TOP-DOWN

Nanolitography

Litography by electron beam

Litography with nanoprinting

BOTTOM-UP

Sol-gel

Spraying

CVD

Atomic and molecular condensation

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GREEN TECHNOLOGIES

AUTHONOMOUS CARS

SOLAR ENERGY

SMART CITIES

RECYCLABLE PLASTICS

SUSTAINABLE CONSTRUCTION

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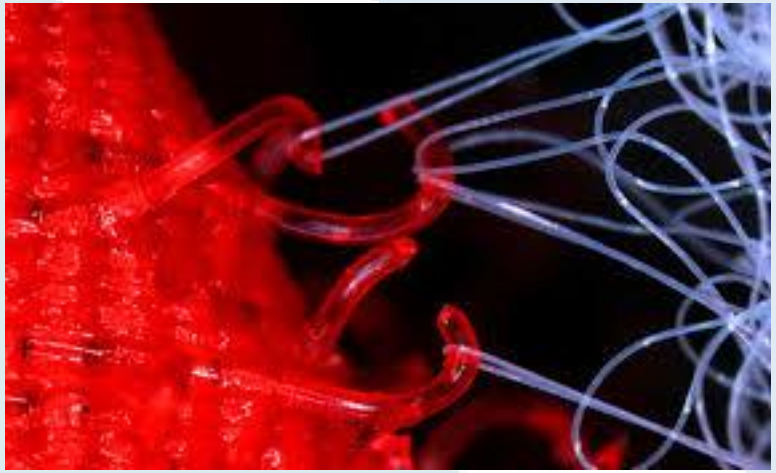
BIOMIMETICS



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ICNF 2019

4th International Conference on Natural Fibers

Smart Sustainable Solutions

1 . 2 . 3 July 2019 . Porto – Portugal

www.icnf2019.fibrenamics.com

CALL for ABSTRACTS
15th February 2019

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