



Δίκτυο ΠΡΑΞΗ



στην υπηρεσία της επιχείρησής σας



δίκτυο διάχυσης τεχνολογίας

*Nanotechnologies, Advanced Materials,
Biotechnology and Advanced
Manufacturing and Processing*

Dr Απόστολος Δημητριάδης
ΕΣΕ για την προτεραιότητα LEIT/NMP
adimi@help-forward.gr

Περιεχόμενα

- ✓ Leadership in enabling and industrial technologies
- ✓ Key Enabling Technologies
- ✓ Θέματα όσον αφορά τις KETs
- ✓ Technology Readiness Levels
- ✓ Συμπράξεις Δημοσίου Ιδιωτικού Τομέα
- ✓ PPPs στον Ορίζοντα 2020
- ✓ Οι προκηρύξεις



Leadership in enabling and industrial technologies

- ✓ Αφορά σημαντικές τεχνολογίες με ευρεία εφαρμογή: Key Enabling Technologies.
- ✓ Έμφαση σε έρευνα και τεχνολογική ανάπτυξη και καινοτομία με έντονη βιομηχανική χροιά.
- ✓ Δραστηριότητες που αναπτύσσονται μέσω σχετικών οδικών χαρτών (ΕΤΠ, ΣΔΙΤ)
- ✓ Απαιτεί βιομηχανικούς εταίρους και μΜΕ
 - ✓ Αποτελεί κλειδί για επιτυχή αξιολόγηση
- ✓ Τα επιχορηγούμενα έργα θα πρέπει να είναι προσανατολισμένα σε αποτελέσματα και να αναπτύξουν σημαντικά τεχνολογικά επιτεύγματα κοντά στην αγορά.

Key Enabling Technologies

- ✓ Έξι στρατηγικής σημασίας τεχνολογίες
 - ✓ Που μπορούν να οδηγήσουν σε ανάπτυξη και ανταγωνιστικότητα
 - ✓ Καίριες ώστε να αντιμετωπιστούν κοινωνικές προκλήσεις
 - ✓ Απαιτούν πόρους
 - ✓ Διαθεματικές
- i. Νανοτεχνολογία
 - ii. Προηγμένα Υλικά
 - iii. Μίκρο και νάνοηλεκτρονική
 - iv. Φωτονική
 - v. Βιοτεχνολογία
 - vi. Προηγμένες μέθοδοι μεταποίησης.

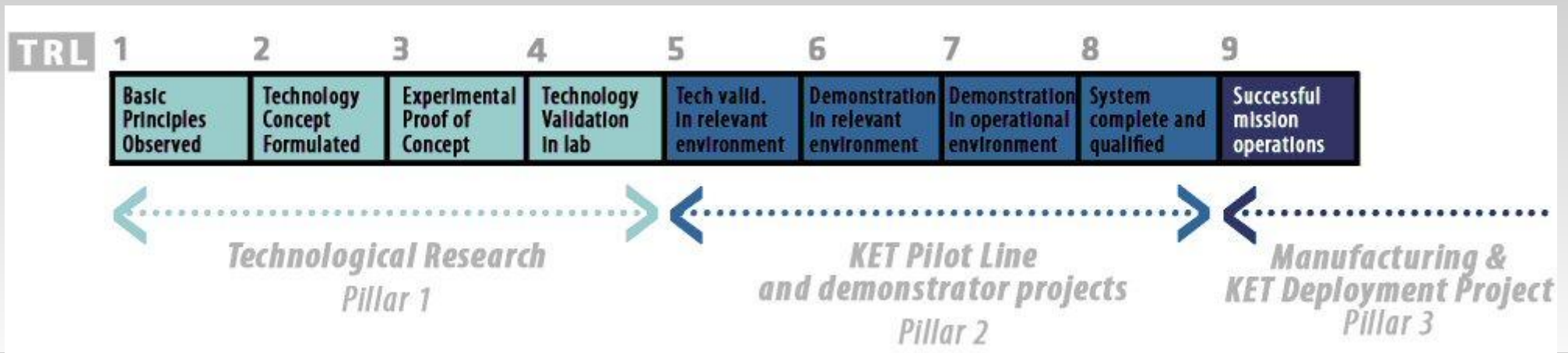


Θέματα όσον αφορά τις ΚΕΤs

- ✓ Ευρώπη έχει ισχυρή θέση όσον αφορά επιστημονική δραστηριότητα και ΔΕ
- ✓ Παρ'όλα αυτά υπάρχει ένα κενό μέχρι την παραγωγή
- ✓ Υπάρχει ανάγκη για έργα που θα βοηθήσουν να ξεπεραστεί το κενό.

Technology Readiness Levels

- ✓ Κλίμακα αξιολόγησης τεχνολογικής ωριμότητας
- ✓ Χρησιμοποιείται στον Ορίζοντα 2020
- ✓ NMP στο 7^ο ΠΠ:
 - ✓ TRLs 1 – 4;
 - ✓ 5-6 in 2012-13 (pilots and demonstrators)
- ✓ H2020 / LEIT KETs: TRLs 3/4 – 7



Συμπράξεις Δημοσίου Ιδιωτικού Τομέα

Public Private Partnership (PPP)

- ✓ Εστιασμένες σε καίριες βιομηχανικές τεχνολογίες
- ✓ Βιομηχανία παίζει καθοριστικό ρόλο στον καθορισμό των ερευνητικών προτεραιοτήτων
- ✓ Προκαθορισμένος προϋπολογισμός και μακροχρόνια σχεδίαση
- ✓ Οδικοί χάρτες με συμμετοχή πολλών ενδιαφερομένων και ευρεία δημόσια διαβούλευση.

PPPs στον Ορίζοντα 2020

Joint Technology Initiatives

- ✓ Innovative Medicines (IMI)
- ✓ Clean Sky
- ✓ Single European Sky ATM Research (SESAR)
- ✓ Fuel Cells and Hydrogen (FCH)
- ✓ Electronic Components and Systems (ECSEL – old ARTEMIS + ENIAC)
- ✓ Bio-based Industries (BBI)

Contractual PPPs (€6,2 δισ.)

- ✓ Factory of the Future (FoF)
- ✓ Energy-efficient Buildings (EeB)
- ✓ Green Vehicles (EGVI)
- ✓ Future internet (5G)
- ✓ Sustainable Process Industry (SPIRE)
- ✓ Robotics
- ✓ Photonics
- ✓ High Performance Computing

Οι προκηρύξεις NMP+B

- ✓ Call for Nanotechnologies, Advanced Materials and Production (NMP)
- ✓ Call for Biotechnology
- ✓ Call for Factories of the Future
- ✓ Call for Energy-efficient Buildings
- ✓ Call for Sustainable Process Industries
- ✓ Call for SILC II- Sustainable Industry Low Carbon II



Call for NMP

2014: 230,7M€
2015: 254M€

Bridging the gap between nanotechnology research and markets

- ✓ Addresses 3 of key European nano-enabled industrial value chains :
 - ✓ Lightweight multifunctional materials and sustainable composites
 - ✓ Structures surfaces
 - ✓ Functional fluids

- ✓ SMEs invited to participate

- ✓ Expected activities : Deployment and market introduction by scaling up lab experience to industrial scale and by demonstrating viability of variety of manufacturing technologies



Bridging the gap between nanotechnology research and markets

NMP 1 – 2014: Open access pilot lines for cost-effective nanocomposites

(RIA, Single Stage 06/05/2014)

NMP 2 – 2015: Integration of novel nanomaterials into existing production lines

(IA, Single Stage 26/03/2015)

NMP 3 – 2015: Manufacturing and control of nanoporous materials

(IA, Single Stage 26/03/2015)

NMP 4 – 2014: High definition printing of multifunctional materials

(IA, Single Stage 06/05/2014)

NMP 5 – 2014: Industrial-scale production of nanomaterials for printing applications

(IA, Single Stage 06/05/2014)

NMP 6 – 2015: Novel nanomatrices and nanocapsules (RIA)

(RIA, Single Stage 26/03/2015)

NMP 7 – 2015: Additive manufacturing for table-top nanofactories (RIA)

(RIA, Single Stage 26/03/2015)



Nanotechnology and Advanced Materials for more effective Healthcare

- ✓ Support more effective therapies in health care for important diseases.
- ✓ Required development: reach point where they can be considered fit for purpose in preparation of, but not including, clinical trial stages.
- ✓ Gender issues important : technologies and innovations should suit both women and men.



Nanotechnology and Advanced Materials for more effective Healthcare

NMP 8 – 2014: Scale-up of nanopharmaceuticals production

(RIA, Single Stage 06/05/2014)

NMP 9 – 2014: Networking of SMEs in the nano-biomedical sector

(CSA, Single Stage 06/05/2014)

NMP 10 – 2014: Biomaterials for the treatment of diabetes mellitus

(RIA, 1 st Stage 06/05/2014, 2 nd Stage 07/10/2014)

NMP 11 – 2015: Nanomedicine therapy for cancer

(RIA, 1 st Stage 26/03/2015, 2 nd Stage 08/09/2015)

NMP 12 – 2015: Biomaterials for treatment and prevention of Alzheimer's disease

(RIA, 1 st Stage 26/03/2015, 2 nd Stage 08/09/2015)



Nanotechnology and Advanced Materials for low-carbon energy technologies & Energy Efficiency

- ✓ Support EU objectives to increase use of renewable energy sources and improve energy efficiency
- ✓ Demonstrate technology readiness for further take-up by societal challenge
- ✓ Contributions to Materials Roadmap Enabling Low Carbon Energy Technologies
- ✓ Time to market should be assessed with view of contributing to EU2020 targets



Nanotechnology and Advanced Materials for low-carbon energy technologies & Energy Efficiency

NMP 13 – 2014: Storage of energy produced by decentralised sources

(RIA, 1 st Stage 06/05/2014, 2 nd Stage 07/10/2014)

NMP 14 – 2015: ERA-NET on Materials (including Materials for Energy)

(Era-Net, Single Stage 26/03/2015)

NMP 15 – 2015: Materials innovations for the optimisation of cooling in power plants

(IA, 1 st Stage 26/03/2015, 2 nd Stage 08/09/2015)

NMP 16 – 2015: Extended in-service life of advanced functional materials in energy technologies

(capture, conversion, storage and/or transmission of energy)

(IA, 1 st Stage 26/03/2015, 2 nd Stage 08/09/2015)

NMP 17 – 2014: Post-lithium ion batteries for electric automotive applications

(IA, Single Stage 07/10/2014)



Exploiting the cross-sector potential of Nanotechnologies and Advanced materials to drive competitiveness and sustainability

- ✓ Boosting European industry competitiveness and contributing to a sustainable economy
- ✓ Enabling multi-sectorial potential, by developing and advancing technological readiness of solutions with break-through potential.
- ✓ International cooperation particularly appropriate.



Exploiting the cross-sector potential of Nanotechnologies and Advanced materials to drive competitiveness and sustainability

NMP 18 – 2014: Materials solutions for use in the creative industry sector

(IA, 1 st Stage 06/05/2014, 2 nd Stage 07/10/2014)

NMP 19 – 2015: Materials for severe operating conditions, including added-value functionalities

(RIA, 1 st Stage 26/03/2015, 2 nd Stage 08/09/2015)

NMP 20 – 2014: Widening materials models

(RIA, 1 st Stage 06/05/2014, 2 nd Stage 07/10/2014)

NMP 21 – 2014: Materials-based solutions for the protection or preservation of European cultural heritage

(IA, 1 st Stage 06/05/2014, 2 nd Stage 07/10/2014)

NMP 22 – 2015: Fibre-based materials for non-clothing applications

(IA, 1 st Stage 26/03/2015, 2 nd Stage 08/09/2015)

NMP 23 – 2015: Novel materials by design for substituting critical materials

(RIA, 1 st Stage 26/03/2015, 2 nd Stage 08/09/2015)

NMP 24 – 2015: Low-energy solutions for drinking water production

(IA, 1 st Stage 26/03/2015, 2 nd Stage 08/09/2015)

NMP 25 – 2014/2015: Accelerating the uptake of nanotechnologies, advanced materials or advanced manufacturing and processing technologies by SMEs

(SME, Phase 1: 18/06/2014, Phase 2: 09/10/2014)



Safety of nanotechnology-based applications and support for the development of regulation

- ✓ Risk management to become integral part of supply chain
- ✓ All projects should align with the EU Nanosafety Cluster and other international activities
- ✓ International cooperation encouraged, in particular with leading nanotechnology developing Nations (US, Canada, Australia, Korea, Japan, China, Brazil)
- ✓ Responsible governance determining for future impact of nanotechnologies on society and economy (KET-support)



Safety of nanotechnology-based applications and support for the development of regulation

NMP 26 – 2014: Joint EU & MS activity on the next phase of research in support of regulation “NANOREG II“

(RIA, 1 st Stage 06/05/2014, 2 nd Stage 07/10/2014)

NMP 27 – 2014: Coordination of EU and international efforts in safety of nanotechnology

(CSA, Single Stage 06/05/2014)

NMP 28 – 2014: Assessment of environmental fate of nanomaterials

(RIA, 1 st Stage 06/05/2014, 2 nd Stage 07/10/2014)

NMP 29 – 2015: Increasing the capacity to perform nano-safety assessment

(RIA, 1 st Stage 26/03/2015, 2 nd Stage 08/09/2015)

NMP 30 – 2015: Next generation tools for risk governance of nanomaterials

(RIA, 1 st Stage 26/03/2015, 2 nd Stage 08/09/2015)



Addressing generic needs in support of governance, standards, models and structuring in nanotechnology, advanced materials and advanced manufacturing and processing

- ✓ Addressing general, structural needs in areas incl.
 - ✓ Infrastructure,
 - ✓ metrology and standards,
 - ✓ skills and networking,
 - ✓ dissemination and communication,
 - ✓ business models
- ✓ Other funding sources such as structural funds, are vital
- ✓ Proactive approach towards international collaboration



Addressing generic needs in support of governance, standards, models and structuring in nanotechnology, advanced materials and advanced manufacturing and processing

NMP 31 – 2014: Novel visualisation tools for enhanced nanotechnology awareness

(CSA, 1 st Stage 26/03/2015, 2 nd Stage 08/09/2015)

NMP 32 – 2015: Societal engagement on responsible nanotechnology

(CSA, Single Stage 26/03/2015)

NMP 33 – 2014: The Materials "Common House"

(CSA, Single Stage 06/05/2014)

NMP 34 – 2014: Networking and sharing of best practices in management of new advanced materials through the eco-design of products, eco-innovation, and product life cycle management

(CSA, Single Stage 06/05/2014)

NMP 35 – 2014: Business models with new supply chains for sustainable customer-driven small series production

(IA, 1 st Stage 06/05/2014, 2 nd Stage 07/10/2014)

NMP 36 – 2014: Facilitating knowledge management, networking and coordination in NMP

(CSA, Single Stage 06/05/2014)

NMP 37 – 2014: Practical experience and facilitating combined funding for large-scale RDI Initiatives

(CSA, Single Stage 06/05/2014)

NMP 38 – 2014/2015: Presidency events

(CSA, Single Stage 06/05/2014)

NMP 39 – 2014: Support for NCPs

(CSA, Single Stage 06/05/2014)

Biotechnology

2014: 51,7M€
2015: 32M€

Cutting-edge biotechnologies as future innovation drivers

- ✓ Synthetic biology : potential to influence or event transform large areas of our economy and society.
 - ✓ Bioinformatics critical to realise full value of biotechnology
 - ✓ Appropriate measures to facilitate effective transfer and implementation into new applications.
-
- ✓ BIOTEC 1 – 2014: Synthetic biology – construction of organisms for new products and Processes
(RIA, 1 st Stage 12/03/2014, 2 nd Stage 26/06/2014)
 - ✓ BIOTEC 2 – 2015: New bioinformatics approaches in service of biotechnology
(RIA, 1 st Stage 24/02/2015, 2 nd Stage 11/06/2015)



Biotechnology-based industrial processes driving competitiveness and sustainability

- ✓ Addresses technology driven R&D targeting industrial bottlenecks.
- ✓ Aim : maintain EU leadership in industrial biotechnology

- ✓ BIOTEC 3 – 2014: Widening industrial application of enzymatic processes
(IA, 1 st Stage 12/03/2014, 2 nd Stage 26/06/2014)
- ✓ BIOTEC 4 – 2014: Downstream processes unlocking biotechnological transformations
(IA, 1 st Stage 12/03/2014, 2 nd Stage 26/06/2014)
- ✓ BIOTEC 5 – 2014/2015: SME-boosting biotechnology-based industrial processes driving competitiveness and sustainability
(SME, Phase 1: 18/06/2014, Phase 2: 09/10/2014)



Innovative and competitive platform technologies

- ✓ Furthering technological development of metagenomics technologies in terms of increased accuracy and costs reduction to expand their potential
- ✓ BIOTEC 6 – 2015: Metagenomics as innovation driver
(RIA, 1 st Stage 24/02/2015, 2 nd Stage 11/06/2015)



Factories of the Future (FoF PPP)

2014: 114M€
2015: 145M€

- ✓ Aim: help EU manufacturers (incl. SMEs) to adapt to global competitive pressures
- ✓ How: developing necessary key enabling technologies across broad range of sectors
- ✓ Meet increasing global consumer demand for greener, more customised and higher quality products
- ✓ Transition to demand-driven industry with lower waste and energy consumption
- ✓ Activities:
 - ✓ Industry-led R&D projects (incl. Demo activities)
 - ✓ Cross-sectoral, addressing needs of SMEs



Factories of the Future (FoF PPP)

FoF 1 – 2014: Process optimisation of manufacturing assets

(RIA & CSA , Single Stage 20/03/2014)

FoF 2 – 2014: Manufacturing processes for complex structures and geometries with efficient use of material

(RIA, Single Stage 20/03/2014)

FoF 3 – 2014: Global energy and other resources efficiency in manufacturing enterprises

(RIA, Single Stage 20/03/2014)

FoF 4 – 2014: Developing smart factories that are attractive to workers

(IA, Single Stage 20/03/2014)

FoF 5 – 2014: Innovative product-service design using manufacturing intelligence

(RIA, Single Stage 20/03/2014)



FoF 6 – 2014: Symbiotic human-robot collaborations for safe and dynamic multimodal manufacturing systems

(IA, Single Stage 20/03/2014)

FoF 7 – 2014: Support for the enhancement of the impact of FoF PPP projects

(CSA, Single Stage 20/03/2014)

FoF 8 – 2015: ICT-enabled modelling, simulation, analytics and forecasting technologies

(RIA & CSA, Single Stage 09/12/2014)

FoF 9 – 2015: ICT Innovation for Manufacturing SMEs (I4MS)

(IA & CSA, Single Stage 09/12/2014)

FoF 10 – 2015: Manufacturing of custom made parts for personalised products

(RIA, Single Stage 09/12/2014)



FoF 11 – 2015: Flexible production systems based on integrated tools for rapid reconfiguration of machinery and robots

(IA, Single Stage 09/12/2014)

FoF 12 – 2015: Industrial technologies for advanced joining and assembly processes of multi Materials

(IA, Single Stage 09/12/2014)

FoF 13 – 2015: Re-use and re-manufacturing technologies and equipment for sustainable product lifecycle management

(RIA, Single Stage 09/12/2014)

FoF 14 – 2015: Integrated design and management of production machinery and processes

(RIA, Single Stage 09/12/2014)



Energy-efficient Buildings (EeB)

2014: 49.5M€
2015: 64M€

- ✓ Drive creation of high-tech building industry - Turning energy efficiency into sustainable business - Fostering EU competitiveness in construction sector on global level
- ✓ Reduce energy consumption & CO₂ emissions in existing and new buildings.
- ✓ Effective integration of key technologies into construction operations for sustainable, long-term competitiveness.
- ✓ Contributes to EU industrial leadership and grand societal challenges
- ✓ Participation of public authorities, asset for some projects as owners of large part of EU building stock.



Energy-efficient Buildings (EeB)

EeB 1 – 2014: Materials for building envelope

(IA, Single Stage 20/03/2014)

EeB 2 – 2014: Adaptable envelopes integrated in building refurbishment projects

(RIA, Single Stage 20/03/2014)

EeB 3 – 2014: Development of new self-inspection techniques and quality check measures for efficient construction processes

(RIA, Single Stage 20/03/2014)

EeB 4 – 2014: Support for the enhancement of the impact of EeB PPP projects

(CSA, Single Stage 20/03/2014)



EeB 5 – 2015: Innovative design tools for refurbishment at building and district level

(IA, Single Stage 09/12/2014)

EeB 6 – 2015: Integrated solutions of thermal energy storage for building applications

(RIA, Single Stage 09/12/2014)

EeB 7 – 2015: New tools and methodologies to reduce the gap between predicted and actual energy performances at the level of buildings and blocks of buildings

(IA, Single Stage 09/12/2014)

EeB 8 – 2015: Integrated approach to retrofitting of residential buildings

(IA, Single Stage 09/12/2014)



SPIRE – Sustainable Process Industries (SPIRE)

2014: 60,3M€
2015: 77M€

- ✓ Resource efficiency essential factor in industry
- ✓ General goal: optimise industrial processing, reducing energy & resources consumption, minimising waste
- ✓ Specific goals :
 - ✓ reduction in fossil energy intensity of up to 30% from current levels by 2030.
 - ✓ reduction of up to 20% in non-renewable, primary raw material intensity compared to current levels by 2030.
 - ✓ reduction of greenhouse gas emissions by 20% below 1999 levels by 2020, further reductions up to 40% by 2030 and at least 80% by 2050.



Sustainable Process Industries (SPIRE PPP)

SPIRE 1 – 2014: Integrated Process Control

(RIA, Single Stage 20/03/2014)

SPIRE 2 – 2014: Adaptable industrial processes allowing the use of renewables as flexible feedstock for chemical and energy applications

(IA, Single Stage 20/03/2014)

SPIRE 3 – 2014: Improved downstream processing of mixtures in process industries

(IA, Single Stage 20/03/2014)

SPIRE 4 – 2014: Methodologies, tools and indicators for cross-sectorial sustainability assessment of energy and resource efficient solutions in the process industry

(CSA, Single Stage 20/03/2014)



SPIRE 5 – 2015: New adaptable catalytic reactor methodologies for Process Intensification

(RIA, Single Stage 09/12/2014)

SPIRE 6 – 2015: Energy and resource management systems for improved efficiency in the process industries

(RIA, Single Stage 09/12/2014)

SPIRE 7 – 2015: Recovery technologies for metals and other minerals

(IA, Single Stage 09/12/2014)

SPIRE 8 – 2015: Solids handling for intensified process technology

(IA, Single Stage 09/12/2014)

Κρίσιμες λεπτομέρειες

- ✓ Εστίαση στο πρόβλημα
- ✓ Το έργο δεν γίνεται για να προωθήσουμε την επιστημονική γνώση μόνο, αλλά και για να λύσουμε συγκεκριμένα προβλήματα.
- ✓ TRL:
 - ✓ Ποια είναι η στάθμη στην αρχή
 - ✓ Πώς θα εξελιχθεί σε κρίσιμα milestones
 - ✓ Που θέλουμε να φτάσουμε
- ✓ Ποιο είναι το δυναμικό των αποτελεσμάτων και πώς θα αξιοποιηθούν – ξεκάθαρη στρατηγική.

Δίκτυο ΠΡΑΞΗ

Σας ευχαριστώ πολύ!



στην υπηρεσία της επιχείρησής σας

πράξη 
δίκτυο διάχυσης τεχνολογίας

Dr Απόστολος Δημητριάδης
ΕΣΕ για την προτεραιότητα LEIT/NMP
adimi@help-forward.gr