This definition will be used in various specific legislations, such as REACH, food, cosmetics and biocide regulation. The analytical challenge to develop measurement methods and instruments to reliably determine particle size and number based size distribution.

(2) Objectives
- Assess the performance of current key measurement techniques
- Improve and further develop key measurement instruments + software
- Classify real world materials (industrial + consumer) according to EC definition
- Guidance to end-users (industry, regulatory bodies)

(3) Methods developed on real world test materials
- Inorganic (nano-) materials: CaCO_3, BaSO_4, TiO_2, nano-steel, kaolin, zeolite
- Organic: pigment yellow, MWCNT, basic methacrylate polymer
- Products incl. nanomaterials: Cosmetics (TiO_2, Al_2O_3), food (SiO_2), plastics

(4) Method concept and approach
- Comprehensive evaluation of existing particle sizing techniques
- Develop scientifically sound 2-tiered measurement approach: (1) rapid, cost-efficient + widely available screening methods, (2) complimentary, more in-depths confirmatory methods for difficult + complex samples
- Guide end-users, such as industry and regulatory bodies, by developing an intelligent decision flow scheme to select appropriate methods, evaluate results and classify materials according to the EC definition

(5) NANODEFINE PRODUCTS + RESULTS
**New SOPs + Validated Methods + Measurement Techniques, Instruments and Software**
- integrated and implemented in the NanoDefiner eTool and Manual
- guidance in the determination of “Nanomaterial” or “No Nanomaterial”

**Method evaluation, development + validation**
- Comprehensive (1) theoretical (expert + literature) and (2) practical evaluation of particle sizing techniques regarding performance to group materials into nano or non-nano according EC definition Babick et al. 2016, Babick & Ullmann 2016
- New standardized dispersion protocols for raw materials, industrial + consumer products
- New or improved SOPs for material characterization with counting (EM, PTA, sp-ICPMS), separating (AC, FFF), spectroscopic (DLS) and integral (BET) techniques
- New tiered approach for material classification based on (2) rapid, cost-efficient screening (BET, AC, spray-DEMA, DLS, VSSA [Wohllieben et al. 2017], PTA, SAXS) and (2) confirmatory (EM, AF4-MALS-ICPMS) techniques for complex materials, such as products
- New eTool “NanoDefiner” based on tiered approach to guide user in material characterization and final classification
- New reference materials + work item proposals for method standardization
- Validation of selected methods by inter-lab comparison under VAMAS/TWA 34 to determine reproducibility for standardization

**Novel software developments**
- Fully automated program to acquire multiple images on TEM and STEM samples
- Novel platform for a cost-efficient Flow-FFF instrument and software
- Patent-protected algorithm and procedure to calibrate PTA concentration measurements

**Novel instrument developments**
- New prototype of HR-SMPS instrument for very small particles
- New prototype electrospray deposition (ESI) system for TEM grids

**Material classification system (MCS)**
- The NanoDefine MCS is method-driven to match materials with appropriate size measurement techniques

**Methods evaluation and development**
- Sizing techniques were evaluated according to uniform performance criteria and measurement requirements resulting from the EC-nanomaterial definition

**Decision flow scheme**
- Guides users through the whole process
- 2-tiered approach grouping and confirmatory methods (nano or non-nano) classification

**Machine-readable Knowledge Base**
- Includes:
  - All techniques and their performance
  - Material characteristics and templates
  - Priorities
  - B2B decision rules

**NanoDefiner eTool and Manual**
- Description and features

**eTool features**
- Not workflow
- Standards-based
- Comprehensive datasets
- Detailed classification and analysis workflow
- Open source code
- NanoDefiner eTool going public

**Screening activity**
- For contact and more information: coordinator@nanodefine.eu www.nanodefine.eu

**This project has received funding from the European Union’s Seventh Programme for research, technological development and demonstration under grant agreement No 604347**