



The European Sensor Systems Cluster (ESSC)

European Sensor Systems Cluster - *ESSC*

Vision, Objectives, Strategies, Priorities and Challenges of EU Cluster

**Cluster launched at Preparatory Workshop on 27 November 2014 in Brussels
sponsored and observed by EC DG Research and Innovation**

COST Action TD1105 - WGs+MC Meeting - 3-5 June 2015

Linköping University, Physics Building, Campus Valla, Session Time: 14:00 - 14:50

Linköping/Sweden, 4 June 2015

Vision, Objectives and Position Paper

Michele Penza - Chairman of the ESSC

michele.penza@enea.it

ENEA, Materials Technologies, Brindisi - Italy



The European Sensor-Systems Cluster (ESSC)

AGENDA of the ROUNDTABLE ESSC

Thursday 4 June 2015 - Session time: 14.00 - 14.50

Action TD1105 ROUND-TABLE DISCUSSION

14:00 - 14:50

Chairman(s):

Michele Penza, Action Chair and ESSC Chairman, ENEA, Brindisi, Italy

Andreas Schuetze, Action WG2 Leader and ESSC WG2 IAQ Leader, Saarland University, Saarbrucken, Germany

EC Policy of the EU Clusters:

The European Sensor-Systems Cluster (ESSC)

14:00 - 14:10

The European Sensor-Systems Cluster (ESSC): Vision, Objectives and Position Paper

Michele Penza, COST Action TD1105 Chair and ESSC Chairman, ENEA, Brindisi, Italy

14:10 - 14:20

The Role of the Project Technical Assistants (PTAs) in the EU Projects and Clusters

Eberhard Seitz, EC PTA, Julich, Germany

14:20 - 14:30

An Industry View in the Commercialization of Gas Sensors for Environmental Sustainability

Hans Martin, R&D Director of SenseAir SA, Delsbo, Sweden

14:30 - 14:50

Discussion of Action/Cluster Participants:

Comments and Inputs on Priorities, R&I Needs, Strategies, Roadmap for future joint-activities of ESSC Cluster and COST Action TD1105 *EuNetAir*

Speeches and Comments from Action WGs/SIGs Leaders and Participants

Free Comments from Action and ESSC Cluster Stakeholders

www.cluster-essc.eu

The European Sensor Systems Cluster (ESSC)

KICK-OFF MEETING ESSC

The European Sensor-Systems Cluster (ESSC)

KICK-OFF MEETING ESSC

Tuesday 19 May 2015 - Session time: 12.00 - 13.30

Nuremberg Convention Center, NCC West - Room Tunis

SENSOR+TEST Trade Fair - AMA Conference 2015

Nuremberg (Germany), 19 - 21 May 2015



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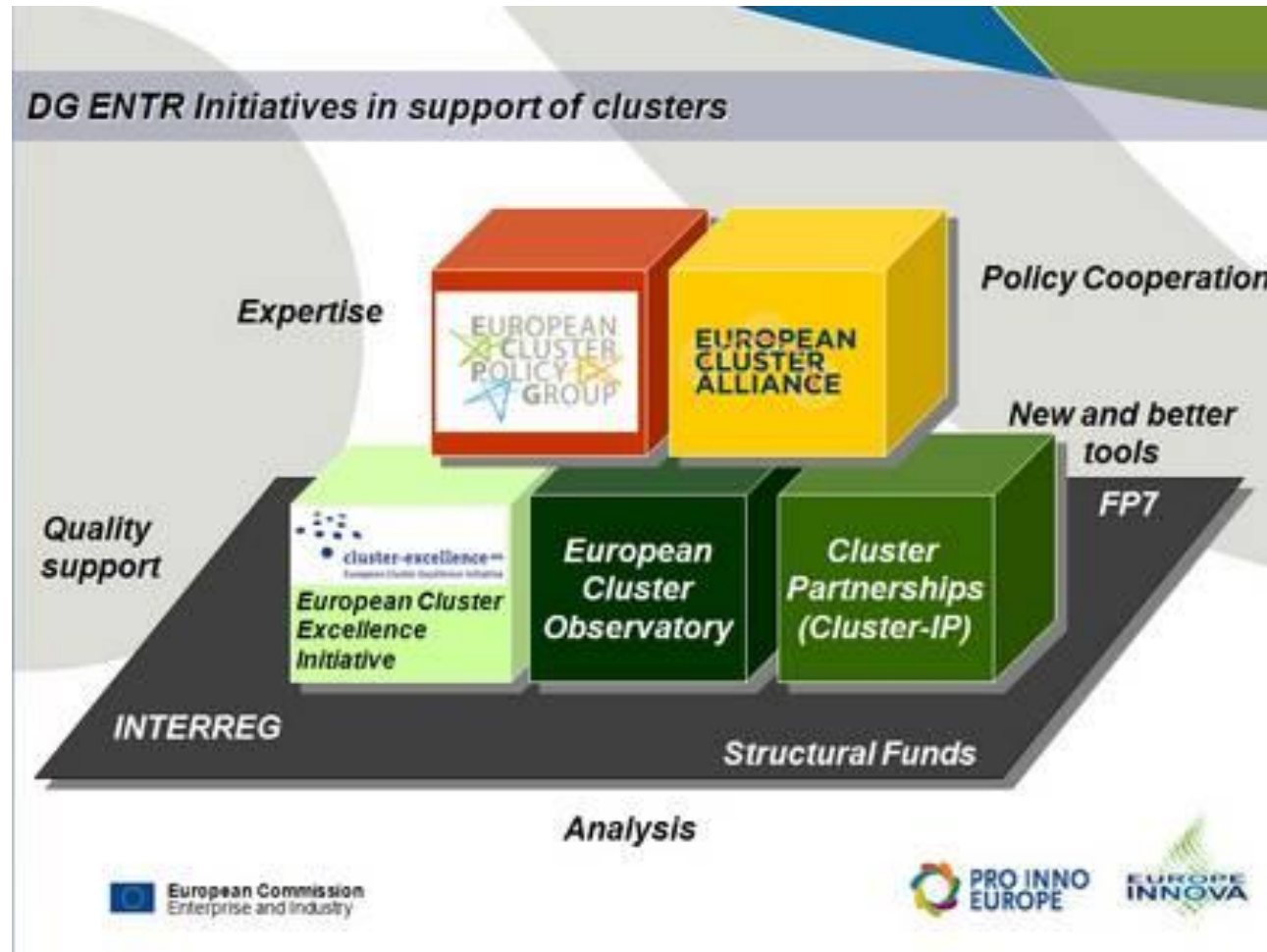


40+ Participants

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CONTEXT POLICY OF THE EU CLUSTERS



EC Report on **Innovation Clusters in Europe:**
A statistical analysis and overview of current policy support
by DG Enterprise and Industry

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The EU CLUSTERS: *EC Expectations*

- 1. Increase the Impact of Research funded under the NMBP Programme**
 - ✓ *Scientifically*
 - ✓ *Technically*
 - ✓ *Commercially*
- 2. Facilitate Networking and help projects to benefit from Synergies**
- 3. Obtain better Advice for future Policy and Call Preparations (Roadmaps, Inputs for Call Topics, long-term Research Goals)**
- 4. Improve Impact, Exploitation and Knowledge Management**
- 5. Raise Visibility of Public Funded Research activities and their Impact**



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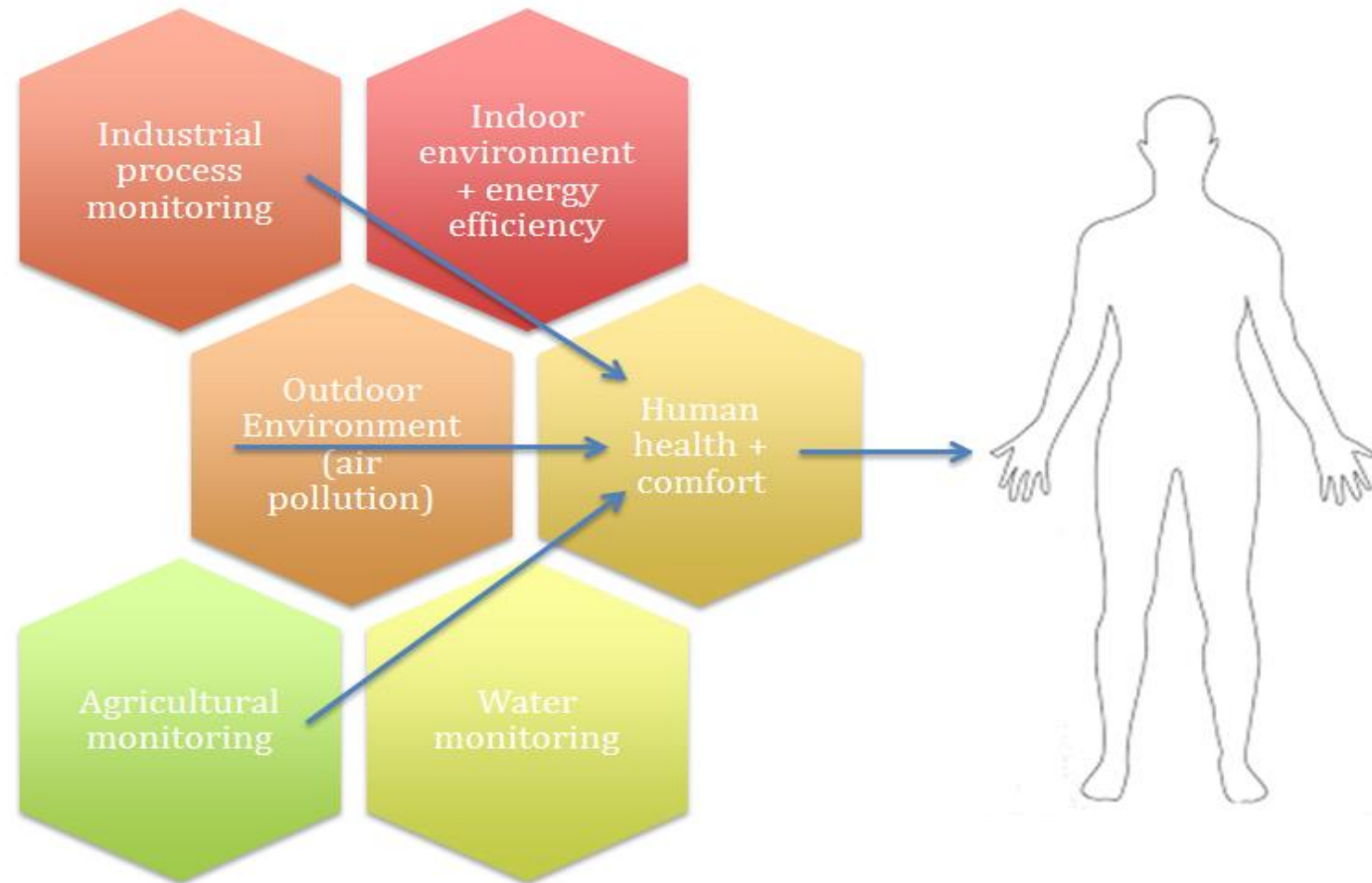
VISION OF ESSC (1/2)

- The **European Sensor System Cluster (ESSC)** will identify the technical or non-technical challenges of (bio)chemical sensing and highlight opportunities resulting from **nanotechnology**, **microsystems integration**, **advanced data evaluation**, their **manufacturing**, **commercialization** and **systemic integration**.
- **ESSC** will mobilize a *pan-European network*, ready to advise, assist and execute the national or international measures leading to **strengthened position of European Research and Innovation** in the field **(bio)chemical sensing** (e.g. analysis, measures proposition, evaluation, reviews).

VISION OF ESSC (2/2)

ESSC Key Areas:

- Environmental Sustainability
- Energy Efficiency
- Health Monitoring
- Comfort
- Industrial Applications



OBJECTIVES OF ESSC

The ESSC is committed to execute objectives, which are defined as follows:

1. Maximize the **cooperation between projects** (avoid duplicating work and improve efficiency)
2. Identify **common interests in on-going research and development** (e.g. open calls, training)
3. Provide a **forum** for discussion, problem solving and analytical planning R&D activities in Europe
4. Establish the **EU-wide meeting platform** for researchers and mainly for involved industries and end-users
5. **Remove commercialization barriers** to ensure the EU leadership in Sensor Technologies
6. **Integrate inputs** and Recommendations from other existing clusters or groups
7. Promote the **connection with external bodies** (EC-RTD, Connect, standardization and regulatory bodies, journals and scientific boards, advisory boards)
8. Disseminate the **sensor-related issues/findings** to informed public (e.g. stimulate awareness for the invisible environmental problems and support *citizen science*)

TECHNOLOGICAL CHALLENGES OF ESSC (1/5)

Preliminary List:

*(to be completed and prioritized in the further **Roadmap** activities)*

- **Indoor Sensing**
- **Environmental Sensing**
- **Biosensors**
- **Chemo/bio Sensors for Liquids**
- **Modelling and Simulation**
- **Analytical Tools and Metrology**
- **Standardization and Regulation**
- **Business Models and Spin-offs**



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TECHNOLOGICAL CHALLENGES OF ESSC (2/5)

- **Improved 3S of sensor materials and More 3S:**
 - ❑ Sensitivity, Selectivity, Stability
 - ❑ Response/Recovery Time, Repeatability, Resolution
- **Miniaturization and integration:**
 - ✓ Low-powered Sensors
 - ✓ Chemical Filters
 - ✓ Catalysts
 - ✓ Pre-concentrators
 - ✓ Low-cost Modules
 - ✓ Sub-systems
- **Integration to systems:**
 - Energy Consumption/Harvesting
 - Data acquisition and Filtering
 - Data Fusion
 - User Interaction

TECHNOLOGICAL CHALLENGES OF ESSC (3/5)

The particular challenges are identified, where R&D efforts should be invested:

- **Indoor Sensing**

- Cross-sensitivity with *specific gases (fatty acids)*
- *Accurate VOC quantification*
- *Long term exposure quantification*
- *Stability and life expectancy*
- Miniaturization, low consumption, controlling and data processing
- Integration to air treatment systems and HVAC (incl. occupancy)
- Human machine interface for comfort

- **Environmental Sensing**

- Scalable sensing models for building Sensor Networks to track key air/water quality parameters
- Sensors complementary to existing tools (larger devices)
- Integration to *mobile devices*
- Low cost, wireless sensors to form *networks (e.g. sensing cities)*
- Targeted *information to habitants* and mitigation
- *Nanoparticle detection* for dust and aerosols

TECHNOLOGICAL CHALLENGES OF ESSC (4/5)

The particular challenges are identified, where R&D efforts should be invested:

- **Biosensors**
 - Disposables vs. *continuous/automatic* monitoring
 - High throughput
 - *Regulatory framework* not fully adapted to personalization
 - Towards *point of care* diagnostics, incl. Telemonitoring
 - Data integrate-ability in *health system*
- **Chemo/bio Sensors for Liquids**
 - High potential, *but low progress*
 - *Multiparametric approach should be investigated*
- **Modeling and Simulation**
 - *Multi-physics model*: analyte flow, material layer, transduction, data processing, integration
- **Industrial Process Monitoring**
 - Better control of processes by increasing the number chemical parameters to be determined continuously (*robust sensors needed*)

TECHNOLOGICAL CHALLENGES OF ESSC (5/5)

The particular challenges are identified, where R&D efforts should be invested:

- **Analytical Tools and Metrology**
 - Validation
 - Joint-exercises *sensors-versus-analyzers* in real scenario measurements
 - Measurement protocols for benchmarking
- **Standardization and Regulation**
 - Standards and data protocols for Data Benchmarking (open access)
 - Validation and standardization of measurement procedures
 - Advanced study of VOC impact on health/productivity
 - Harmonization/Regulation/Public information of measured sites/households
 - Regulation/Public info on industrial products - e.g., real time styrene monitoring
- **Business Models and Spin-offs**
 - Total cost of ownership vs. savings in comfort environment
 - Food quality monitoring and price adaptation (realtime S/D)
 - Health system rewarding for early testing and monitoring

GOVERNANCE: Steering Committee of ESSC (1/2)

- **Chairman of ESSC:** Michele Penza, ENEA, Italy
- **Coach of ESSC:** Rudolf Frycek, Amires, Switzerland
- **EC Observer:** Hans Hartmann Pedersen (*EC Officer*), DG R&I, Belgium

Environmental Sensors

- D. Diamond

Indoor Air Quality

- A. Schütze (O. Martimort)

Health Monitoring and Comfort Sensors

- P. Galvin (A. Prina Mello)

Monitoring of Industrial Processes

- T. Mayr

Sensor Integration and Commercialization

- O. Martimort

Dissemination and Outreach

- T. Simmons (Eurice)

GOVERNANCE OF ESSC (2/2)

- **Chairman of ESSC:** Michele Penza, ENEA, Italy - michele.penza@enea.it
- **Coach of ESSC:** Rudolf Frycek, Amires, Switzerland - frycek@amires.eu
- **EC Observer:** Hans Hartmann Pedersen (*EC Officer*)
hans-hartmann.pedersen@ec.europa.eu

Application WG	Leader	Institution	Email
Environmental Sensors	D. Diamond	Dublin City Uni	dermot.diamond@dcu.ie
Indoor Air Quality	A. Schütze	Saarland Univ.	schuetze@lmt.uni-saarland.de
Health Monitoring and Comfort Sensors	P. Galvin	Tyndall	paul.galvin@tyndall.ie
Monitoring of Industrial Processes	T. Mayr	TU Graz	torsten.mayr@tugraz.at
Sensor System Integration and Commercialization	O. Martimort	Nanosense	martimort@nano-sense.com
Dissemination and Outreach	T. Simmons	AMA Sensorik	simmons@ama-sensorik.de

PARTNERS supporting ESSC



Italian National Agency for New Technologies,
Energy and Sustainable Economic Development



Brandenburgische
Technische Universität
Cottbus - Senftenberg



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FP7/H2020 PROJECTS & Actions supporting ESSC



FUNDING and NETWORKING of ESSC

- **No specific funding yet**
- Use resources within *running EU projects*
- Use resources of your environment (e.g. associations, institutions)
- Continue **defining which specific funding** is urgently in need and use Cluster to build **critical mass and to communicate it**
- **Any Interlink with the other European Societies, Bodies, Associations, Platforms and ESSC ???**
For instance: EMRS, IMCS, ISOCS, EuroSensors,

ESSC CONTACT PERSONS:

- **Chairman of the ESSC: Dr. Michele Penza (ENEA, Brindisi, Italy)**
- michele.penza@enea.it
- **Coach of the ESSC: Dr. Rudolf Frycek (Amires, Neuchatel, Switzerland)** - frycek@amires.eu
- **EC Observer of ESSC: Dr. Hans Hartmann Pedersen (DG R&I)**
hans-hartmann.pedersen@ec.europa.eu

THANK YOU VERY MUCH FOR YOUR KIND ATTENTION !

REGISTRATION AS ESSC MEMBER at:

www.cluster-essc.eu

European Commission - DG Research & Innovation
Directorate Key Enabling Technologies
Unit Advanced Materials and Nanotechnologies

