
Modern manufacturing methods for materials: green & nano and quantum technologies

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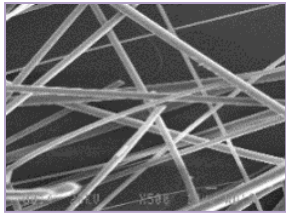
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Green technologies

Insulation materials



Foamed glass.



Stone wool fibers

- Recycling and use of secondary raw materials
- Novel composites
- Glass foaming mechanism
- Crystallization processes
- TRL: 1-9

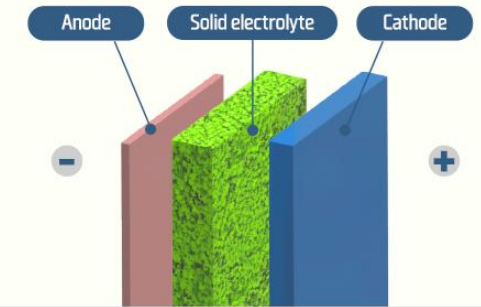
Green hydrogen



- Green Deal activities
- (Photo)electrochemical (sea)water splitting – direct/indirect
- Nobel metal-free cocatalysts
- Use of recycled solar panels
- Production of NH_3

Batteries

All-solid-state battery



- Sodium and lithium-ion batteries
- Solid-state electrolyte batteries
- Safety aspect
- Thin-film battery research - integration with IC

Magnetic materials



Rotor



Wind generator

- Recycling of rare earth elements
- Reprocessing permanent magnets with reduced content of rare earth elements
- 3D printing of magnetic materials and complex alloys
- The European Critical Raw Materials Act

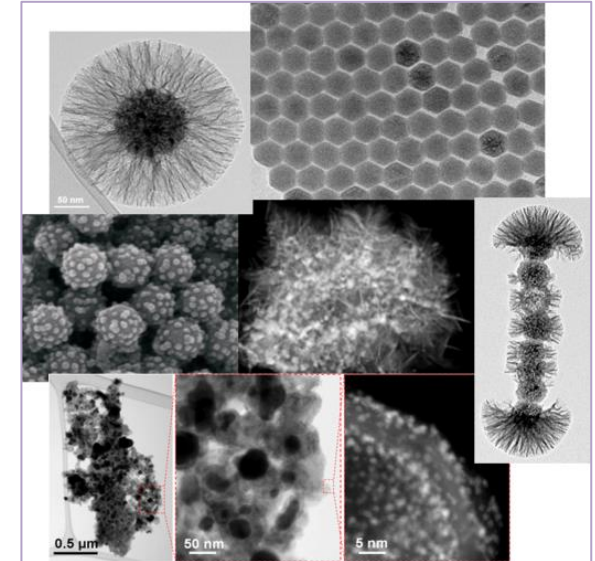
Materials for electronics



Ceramic pressure sensor

- Discrete and integrated components
- Varistors, capacitors, PTCR
- Materials for 5G
- Components without Pb
- Heterogeneous Integration
- Control of synthesis (atomic and microstructural level)
- The European Chips Act

Functional coatings



- Controlled synthesis of nanoparticles
- Regulation of surface properties
- Preparation of stable suspensions
- Dispersing into polymer matrices
- Formation of nanocomposites

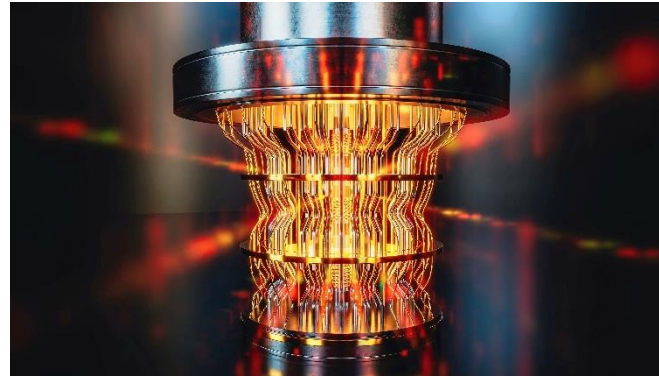
Quantum technologies

Quantum communications



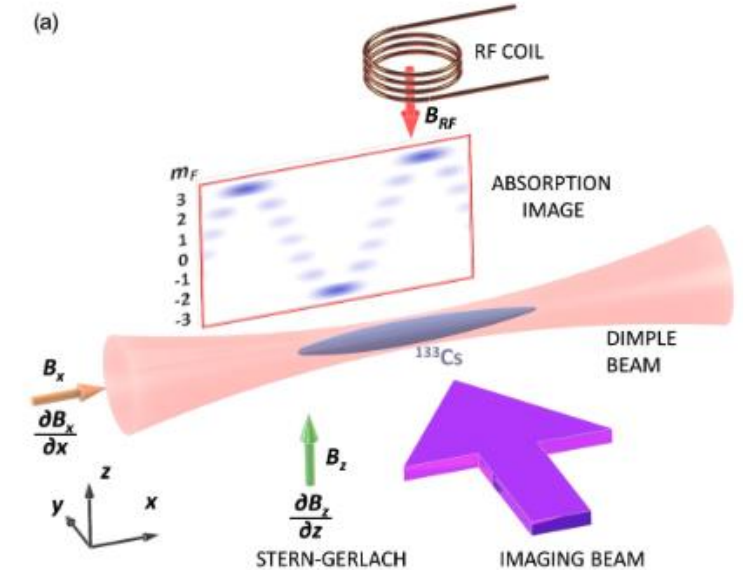
- Setting up a demonstration national network
- Quantum random number generators for cryptographic use
- Quantum internet - quantum entangled photons for next generation quantum networks

Quantum computing



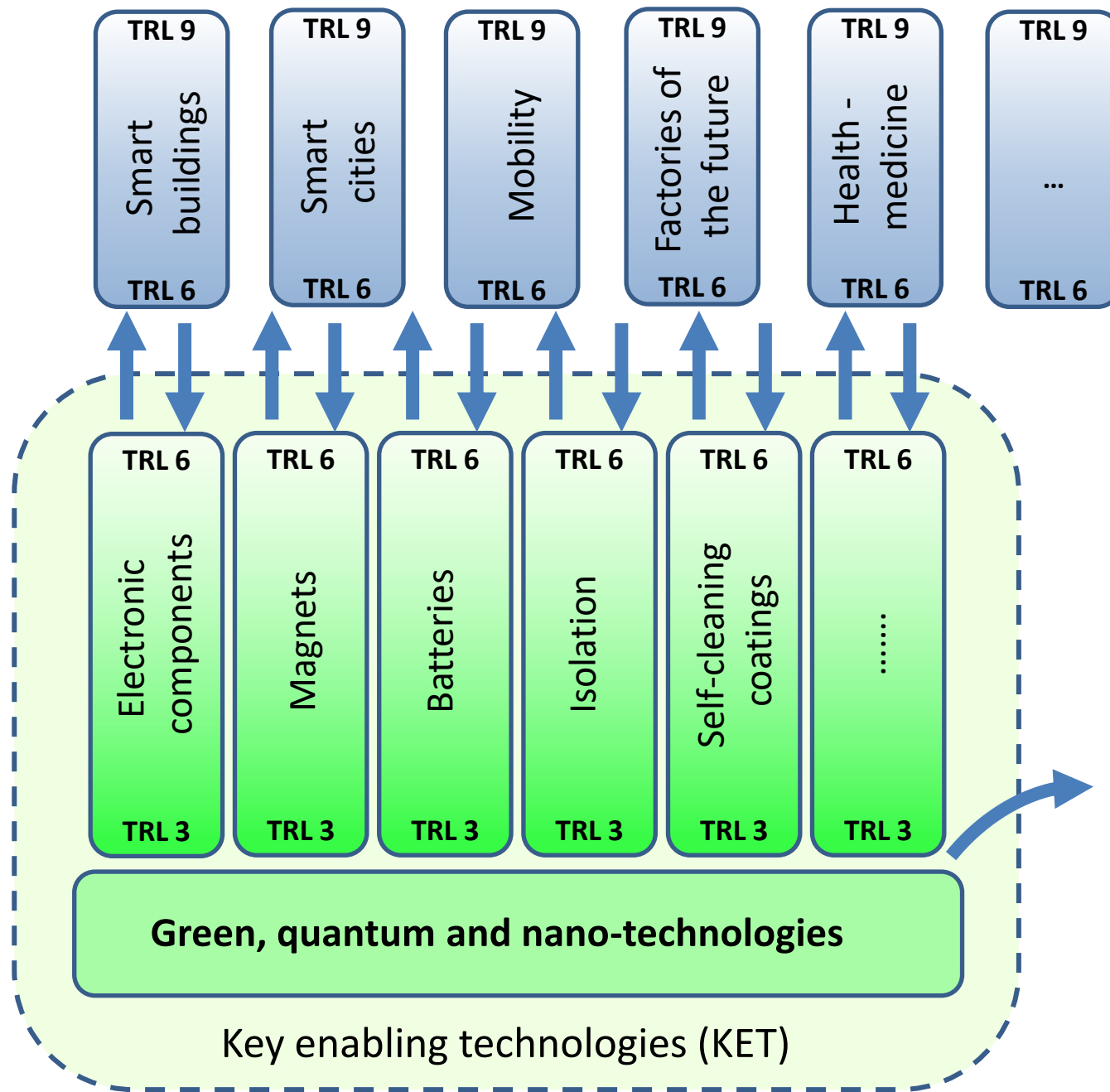
- Systems of ultracold atoms
- Superconducting devices
- Development of algorithms and tools
- Testing quantum computers
- Quantum memories

Quantum sensorics

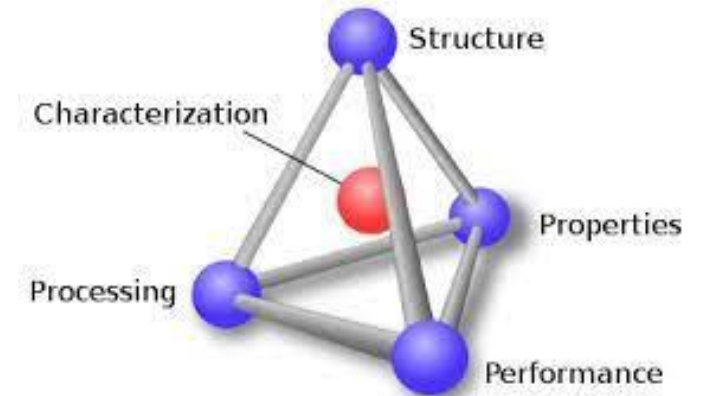


- Optical magnetometry

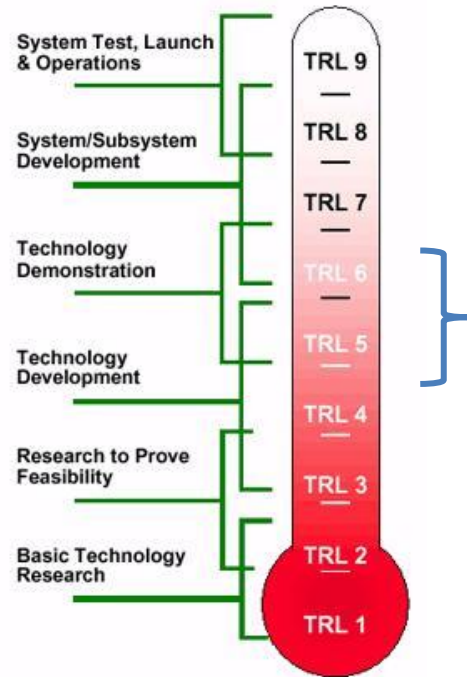
- The European Quantum Act



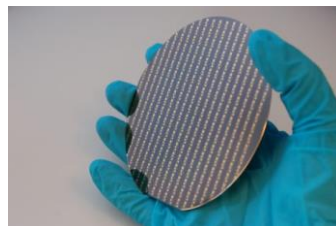
Integration with
diverse value
chains



OBJECTIVE 1: Development and demonstration of KETs



Pilot line



Pilot plant



OBJECTIVE 2: Clean room with associated technologies

- The first joint R&D center of industry and research organizations in Slovenia



IJS PLUS

- 💡 **Light**, optics, photonics
- 💻 **Matter**, materials, electronics
- 🔗 **Quanta**, principles driving research breakthroughs



- 🧪 Physics
- 🧴 Chemistry and biology

- 🔬 Materials
- 🌐 Information and communication technologies, artificial intelligence

- **Internationalization:** international conferences, partnerships, associations
- **Education:** conducting workshops, staff training
- **Exchange of good practices:** involvement in international projects

