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# Do policy-makers dream of Electric Data ?

## Or musings on the application of AI to STI policy

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# How can AI be applied to science, technology and innovation policy ?

1. **Data-driven Decision Making:**
    1. **Analysis of Research Trends:** AI can analyse vast amounts of scientific literature, patents, and research data to identify emerging trends in various scientific and technological domains, helping policymakers make informed decisions.
    2. **Funding Allocation:** AI can assist in optimizing the allocation of research funding by identifying areas with high potential for innovation and societal impact.
2. **Technology Forecasting and Road mapping:**
    1. **Predictive Modelling:** AI can predict the future development of technologies and their potential impact on society, aiding in the creation of long-term technology roadmaps.
    2. **Identification of Emerging Technologies:** AI can scan the technological landscape to identify emerging technologies that may warrant policy attention and support.
3. **Innovation Ecosystem Analysis:**
    1. **Start-up Ecosystem Support:** AI can analyse start-up ecosystems, identifying areas with high innovation potential and suggesting policies to support entrepreneurship and innovation.
    2. **Collaboration Opportunities:** AI can identify opportunities for collaboration between academia, industry, and government agencies to foster innovation.
4. **Intellectual Property Management:**
    1. **Patent Analysis:** AI can analyse patent databases to identify technological trends, potential areas of conflict, and opportunities for collaboration.
    2. **IP Policy Optimization:** AI can assist in the development of intellectual property policies that balance the need for innovation with fair competition.
5. **Science and Technology Diplomacy:**
    1. **Global Collaboration Opportunities:** AI can analyse global scientific collaborations and help identify opportunities for international partnerships in research and innovation.
    2. **Policy Harmonization:** AI can assist in comparing and harmonizing STI policies across different regions to facilitate global cooperation
6. **Research Prioritisation and Portfolio Management:**
    1. **Optimising Research Portfolios:** AI can help policymakers prioritize research areas based on societal needs, economic impact, and scientific potential.
    2. **Identifying Gaps and Redundancies:** AI can analyse research portfolios to identify gaps and redundancies, ensuring a more efficient allocation of resources.
7. **Ethical Considerations in Research and Development:**
    1. **Ethical AI in Research:** AI can be used to assess and ensure ethical considerations in research and development, helping policymakers address ethical challenges associated with emerging technologies.
    2. **Public Engagement:** AI can facilitate public engagement and feedback mechanisms to incorporate societal values into STI policies.
8. **Technology Transfer and Commercialization:**
    1. **Market Analysis:** AI can analyse market trends and potential commercialization opportunities for research outcomes, guiding policies that facilitate technology transfer.
    2. **Licensing and Regulation:** AI can assist in developing policies for licensing and regulating the commercialization of innovative technologies.
9. **Monitoring and Evaluation:**
    1. **Impact Assessment:** AI can be used to assess the impact of STI policies, providing policymakers with data-driven insights for continuous improvement.
    2. **Real-time Monitoring:** AI can enable real-time monitoring of the implementation of STI policies, allowing for timely adjustments as needed.
10. **Education and Skill Development:**
    1. **Identifying Skill Gaps:** AI can analyse the evolving skill requirements in the technology sector, assisting policymakers in designing education and training programmes that align with industry needs.
    2. **Personalised Learning:** AI can enhance educational approaches, providing personalised learning experiences to nurture the next generation of scientists and innovators.

# Challenge 1 – fix data availability for the Regional Innovation Scoreboard

| Framework conditions | |
|---|---|
| Human Resources | 1.1.1 New doctorate graduates (ISCED 6) per 1000 population aged 25-34 |
| | 1.1.2 Percentage of population aged 25-34 having completed tertiary education |
| | 1.1.3 Percentage population aged 25-64 participating in lifelong learning |
| Attractive research systems | 1.2.1 International scientific co-publications per million population |
| | 1.2.2 Scientific publications among top 10% most cited publications worldwide as % of total scientific publications of the country |
| | 1.2.3 Foreign doctorate students as a percentage of all doctorate students |
| Digitalisation | 1.3.1 Broadband penetration |
| | 1.3.2 Individuals who have above basic overall digital skills (% share) |

| Investment | |
|---|---|
| Finance and support | 2.1.1 R&D expenditure in the public sector (% of GDP) |
| | 2.1.2 Venture capital expenditures (% of GDP) |
| | 2.1.3 Direct government funding and government tax support for business R&D |
| Firm investments | 2.2.1 R&D expenditure in the business sector (% of GDP) |
| | 2.2.2 Non-R&D innovation expenditures (% of turnover) |
| | 2.2.3 Innovation expenditures per person employed |
| Use of information technologies | 2.3.1 Enterprises providing training to develop or upgrade ICT skills of their personnel |
| | 2.3.2 ICT specialists (as a percentage of total employment) |

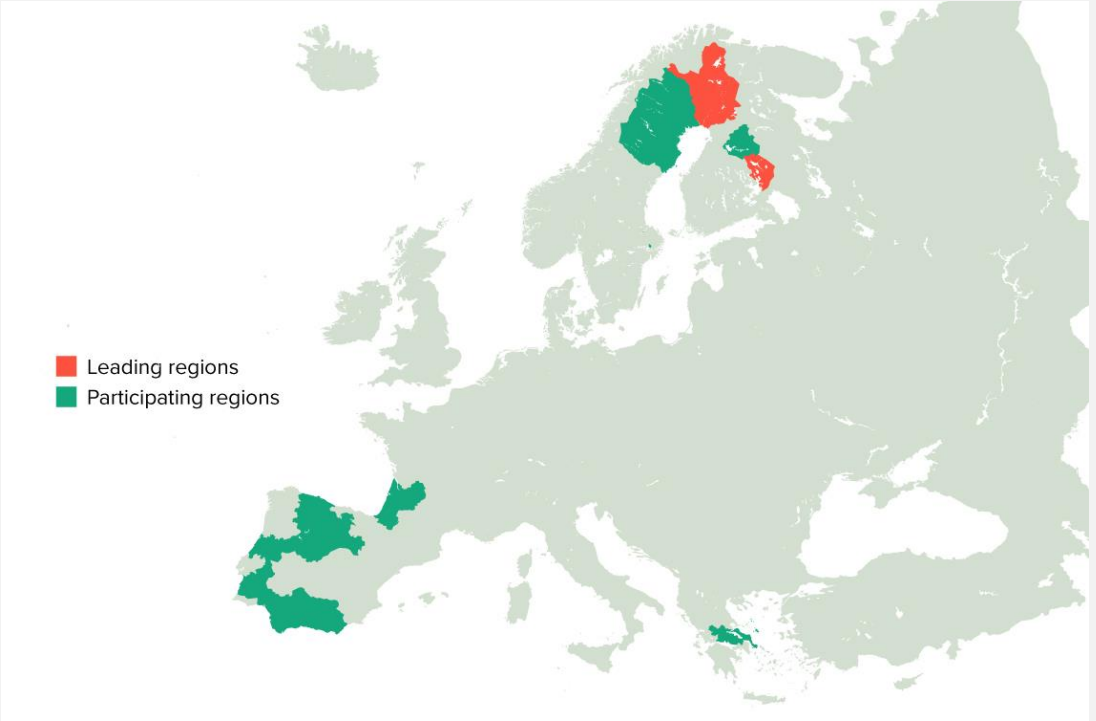
| Innovation activities | |
|---|---|
| Innovators | 3.1.1 SMEs introducing product innovations (% of SMEs) |
| | 3.1.2 SMEs introducing business process innovations (percentage of SMEs) |
| Linkages & entrepreneurship | 3.2.1 Innovative SMEs collaborating with others (% of SMEs) |
| | 3.2.2 Public-private co-publications per million population |
| | 3.2.3 Job-to-job mobility of Human Resources in Science & Technology |
| Intellectual Assets | 3.3.1 PCT patent applications per billion GDP (in PPS) |
| | 3.3.2 Trademark applications per billion GDP (in PPS) |
| | 3.3.3 Design applications per billion GDP (in PPS) |

| Impacts | |
|---|---|
| Employment impacts | 4.1.1 Employment in knowledge-intensive activities |
| | 4.1.2 Employment in innovative enterprises |
| Sales impacts | 4.2.1 Exports of medium and high techn products as a share of total product exports |
| | 4.2.2 Knowledge-intensive services exports as % of total services exports |
| | 4.2.3 Sales of new-to-market and new-to-enterprise innovations |
| Environmental sustainability | 4.3.1 Resource productivity |
| | 4.3.2 Air emissions by fine particulate matter (PM2.5) in Industry |
| | 4.3.3 Development of environment-related technologies |

EIS indicators not included within the RIS Framework

# Challenge 2 – identify complementarities across inter-regional innovation ecosystems

- Thematic smart specialisation partnerships seek to identify and then activate complementary expertise and resources in specific STI fields (leading to I3 and EIE/Regional innovation valleys);
- Currently the mapping of potential synergies is a 'manual' exercise (survey, workshops, data/document review, etc.),
- Can AI tools be used to map deeper and broader potential for co-operation and joint investment to foster inter-regional value chains and innovation networks ?



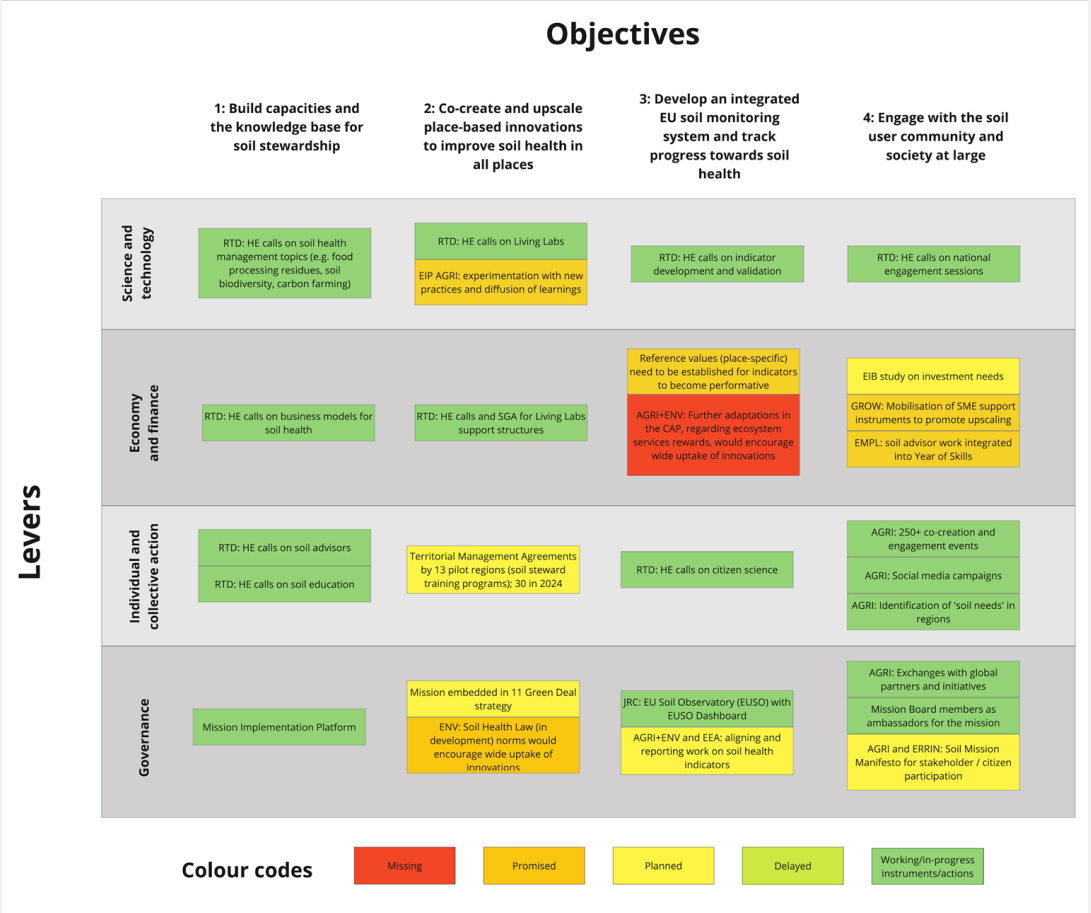

**S3P Mining Industry and Global Value Chain**

Leading regions: Lapland (FI), North Karelia (FI)

Participating regions: Kainuu (FI), Bergslagen (SE), Västerbotten (SE), Norrbotten (SE), Castilla y Leon (ES), Andalusia (ES), Asturias (ES), Alentejo (PT), Centro Portugal (PT), Sterea Ellada (GR), Nouvelle-Aquitaine (FR)

# Challenge 3 – map networks of actors and portfolios of projects contributing to EU missions

- EU Missions are multi-level initiatives implying the need to identify relevant (quadruple helix) stakeholders at the EU level (already complex) but also the national, regional and local levels.
  - AI could help both identify and map (sub-) networks of actors and provide tools for match-making and partnership building.
- Tracking the portfolio of actions, investments and funding instruments at all these levels is hugely time consuming and assessing their contribution to the mission theory of change even more so.
  - How can AI tools be applied to support the management of EU missions ?



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# Thank you

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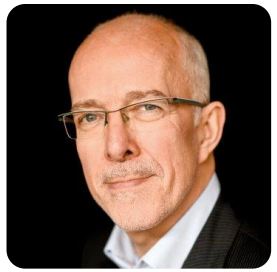


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