BCO Network

BCO Network WEBseries

Digital transition for rural areas:

The JRC Toolkit

The Smart Villages approach

25 March 2025

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Funded by the European Union

Digital transition:

Long-term implications for EU farmers & rural communities

25th of March 2025

Greta Hauer

https://policy-lab.ec.europa.eu/index_en

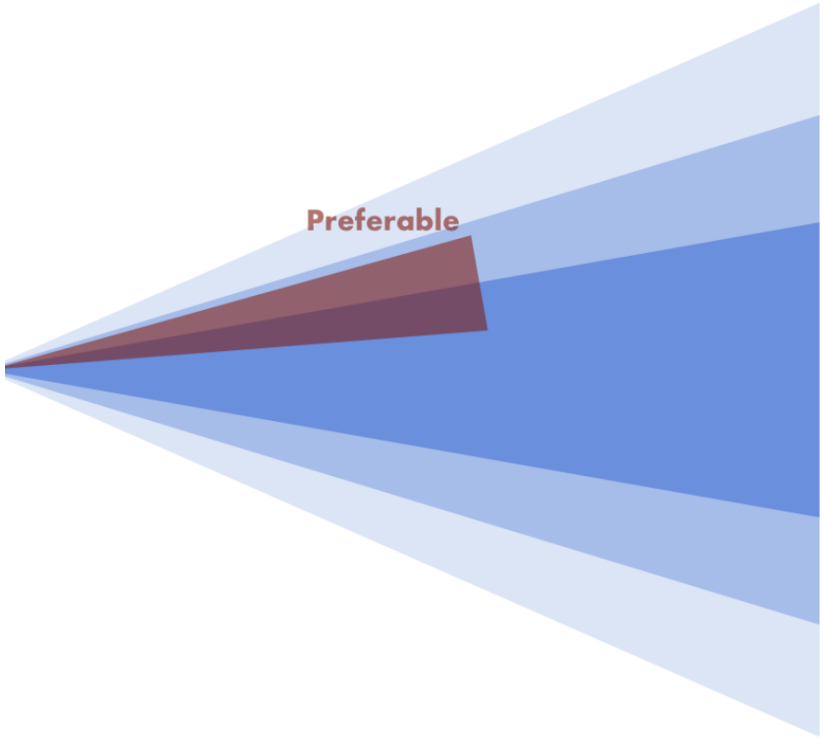
What is Foresight?

Medium/long-term perspective

Collective intelligence about future

Plausible rationales of possible developments

Future as something to **shape**



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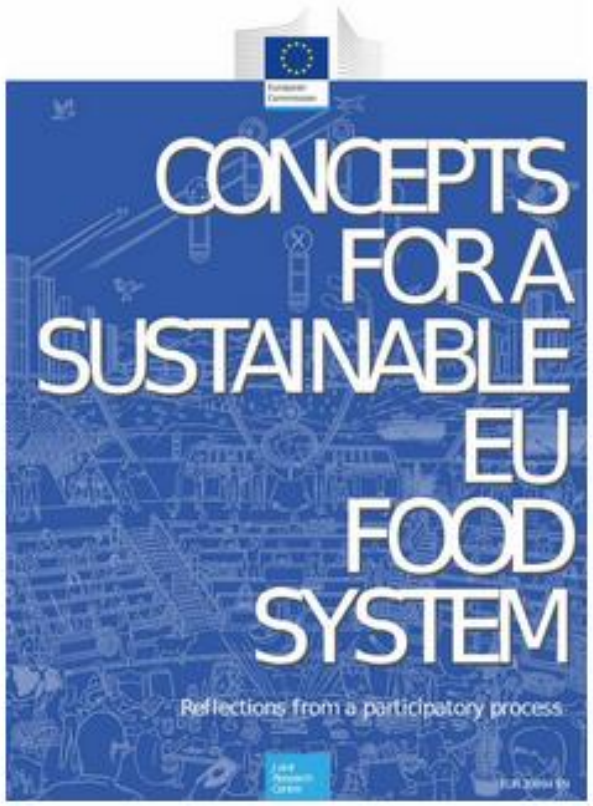
Building on previous JRC projects



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Why using foresight for digital transition?

- Digital transition moves ahead at fast speed
- Technological treadmill, mostly driven by private sector
- Public sector risks lagging behind while it has roles and responsibilities

- Strategic foresight helps:
- Systemic **understanding** of trends – multiple perspectives
- **Anticipate** change, both incremental and disruptive
- Build **priorities**, **vision**, **strategy**

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The team

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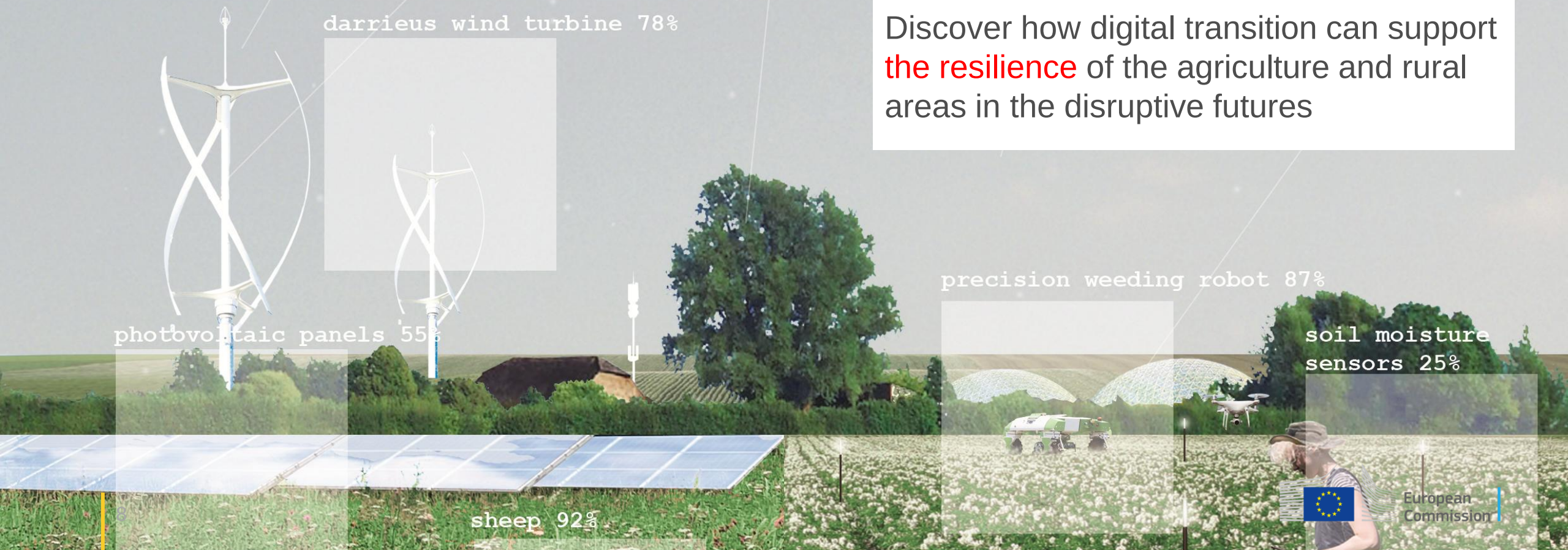
Anne-Katrin Bock

EU Policy Lab

Commission

Digital transition: Long-term implications for EU farmers & rural communities

Discover how digital transition can support the resilience of the agriculture and rural areas in the disruptive futures



Links

[Link to the report]

[Link to the digital version of the toolkit]

Digital Transition: Long-term implications for Farmers and Rural Communities

[Link to the video about the study]

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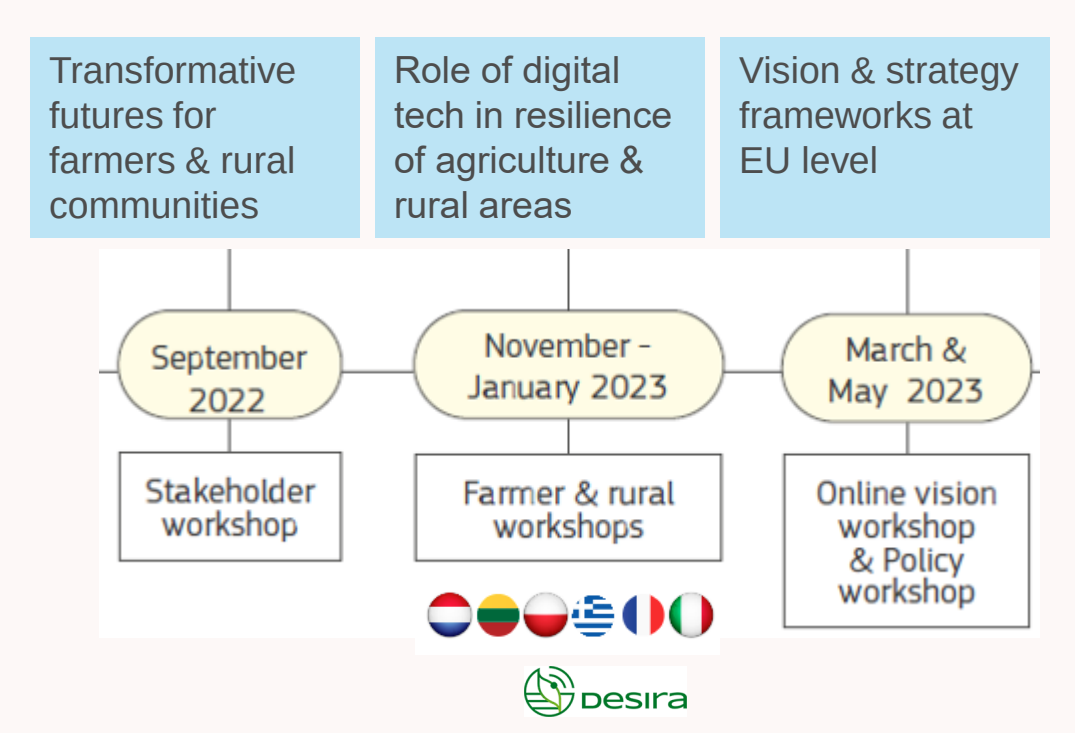
Overview of the foresight process



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Transformative futures 2040

Navigating Storms

High energy prices hinder advanced technologies. Food scarcity and land competition fuel social unrest. Regions focus on becoming self-sufficient, through decentralised solutions and frugal digital technologies.

Community revival amid technological collapse

Disruption of energy & internet connectivity infrastructure due to extreme weather events leads to frequent power outages, unstable internet connection & soaring energy prices.

Reclaiming digital sovereignty

When satellites fail, corporate farms struggle. Small independent farmers form communities focused on digital sovereignty and develop their own technologies.

Resilient roots to withstand the shocks

Despite disruptions to technologically advanced farms due to satellite failure, progress towards sustainability continues thanks to the resilience of regenerative farms and support from the green tech industry.

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Implications for resilience

- Broadband deployment as a foundation for resilience & critical enabler
- Robustness to withstand extreme climate events and energy shortages
- Contingency for service interruptions & support to traditional communication
- Energy-efficient broadband solutions for self-sufficiency, alternative energy sources
- Support for decentralisation in technology (local networks and data centers) to promote regional self-reliance and autonomy

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What is the purpose of digital transition?

Which values & principles to guide it?

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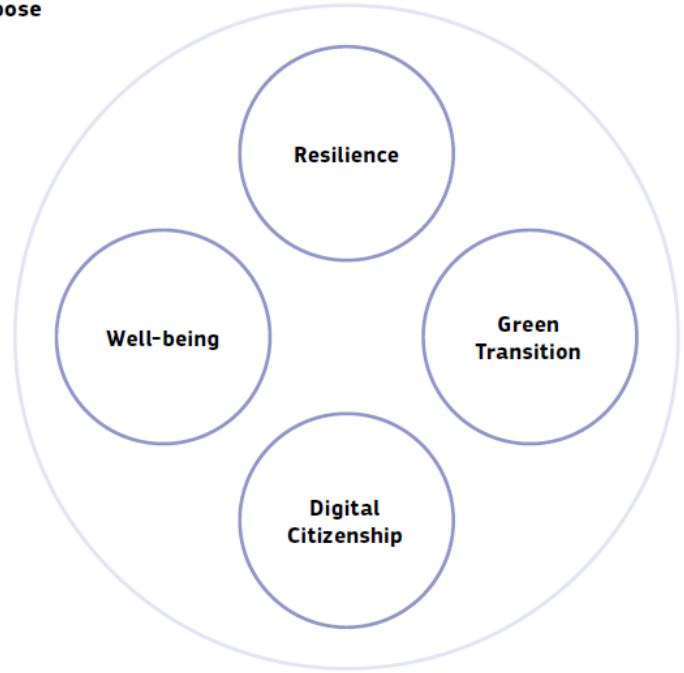
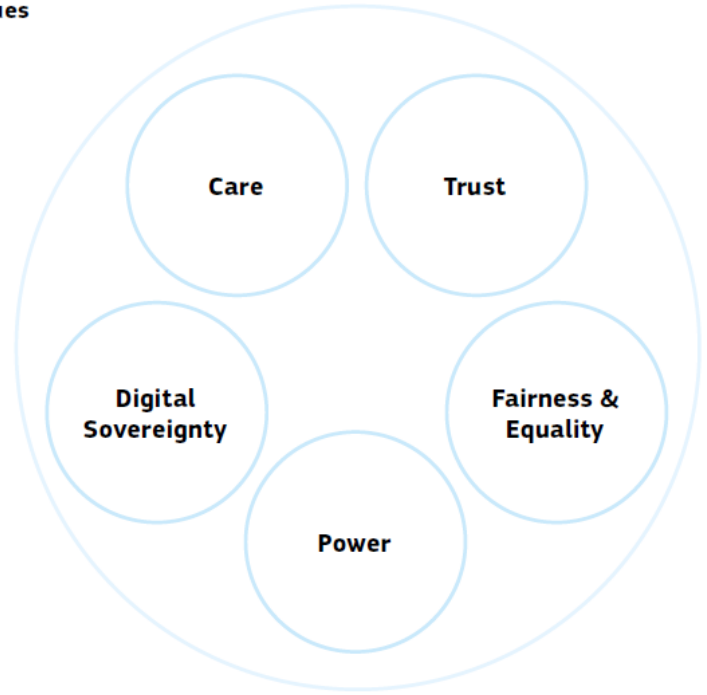
Vision Framework

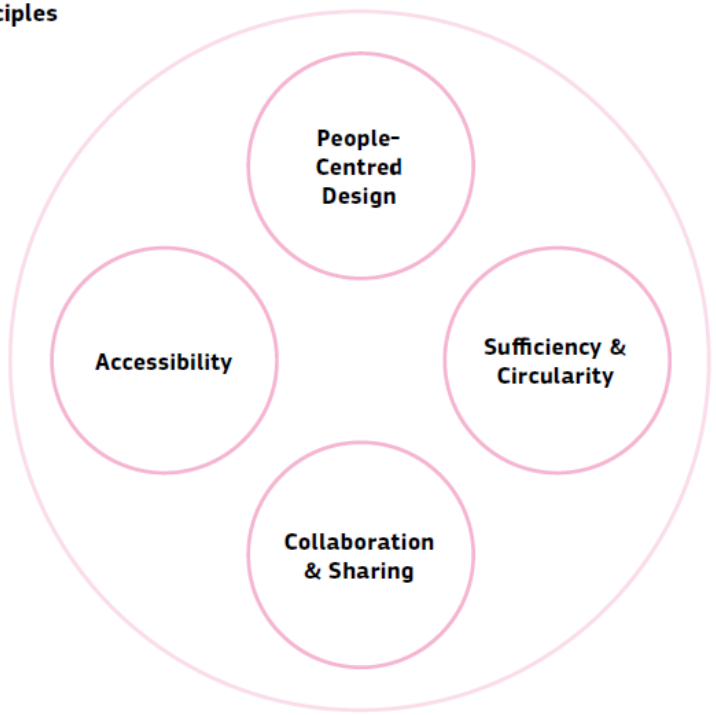
Purpose



Values



Principles



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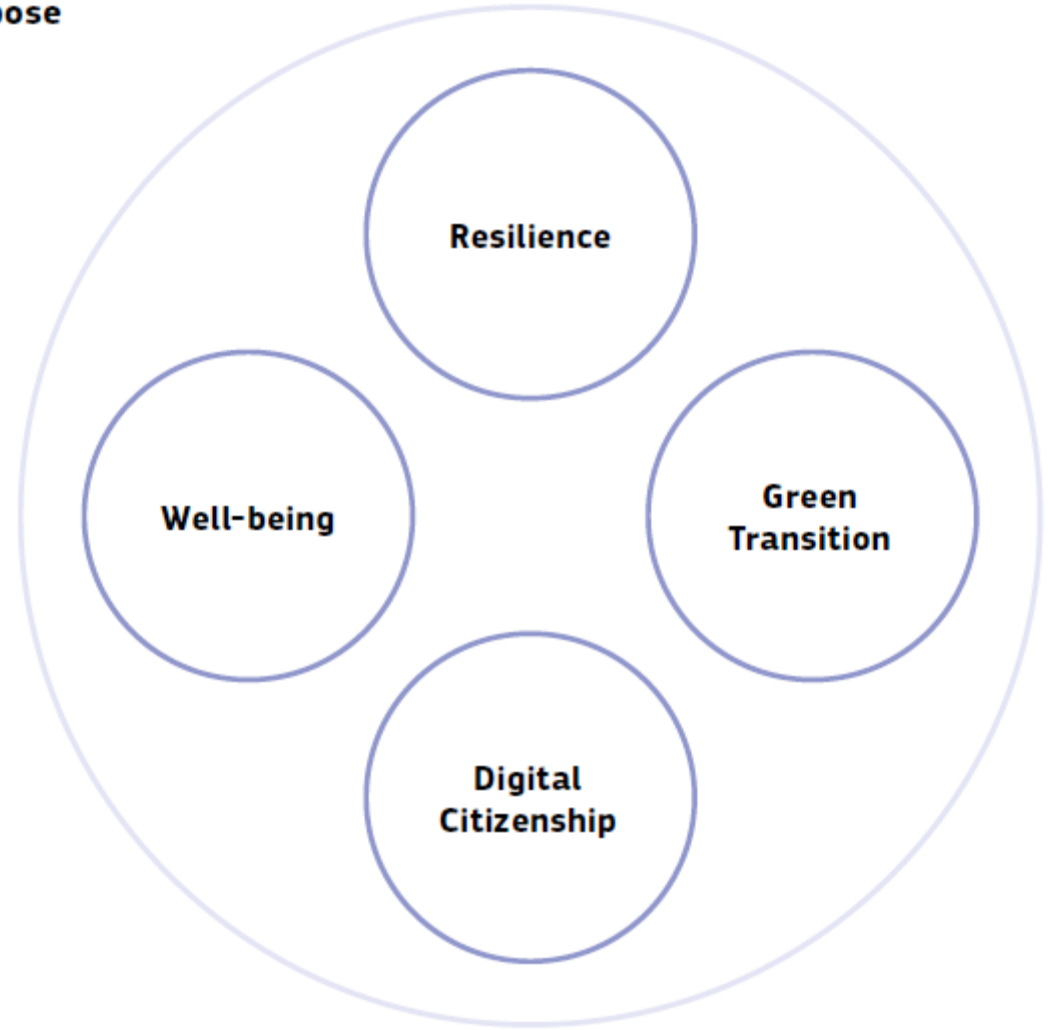
Purpose



Resilience of infrastructure
From providing connectivity to ensuring a resilient digital ecosystem that supports green transition

Green transition: Aligning with sustainability goals
Energy-efficient technologies & practices in broadband infrastructure

Enable digital citizenship
Provide tools & platforms for active participation in the society

Enhance well-being through connectivity
Improve access to services & opportunities (health care, education, social services)

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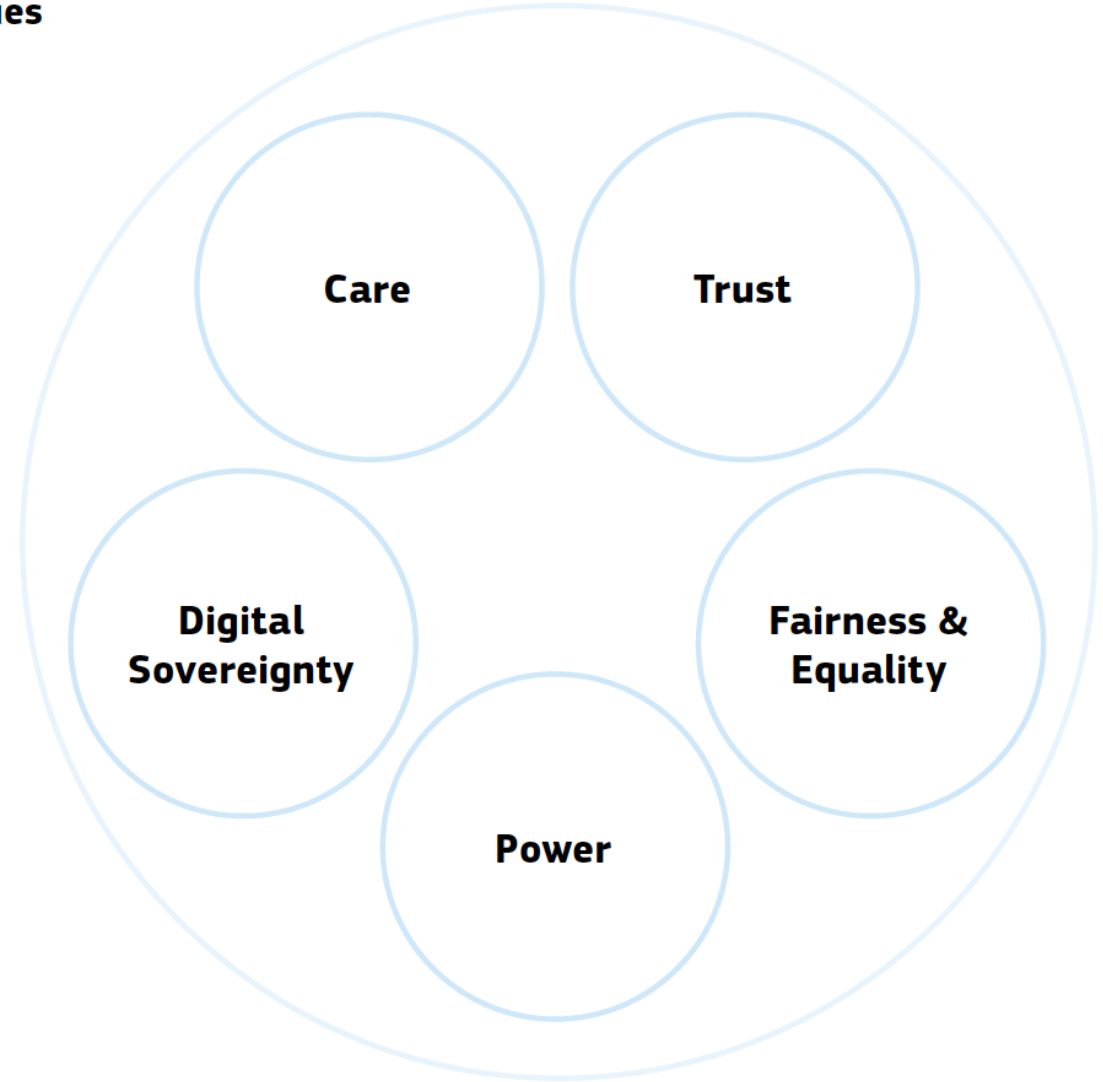
Values



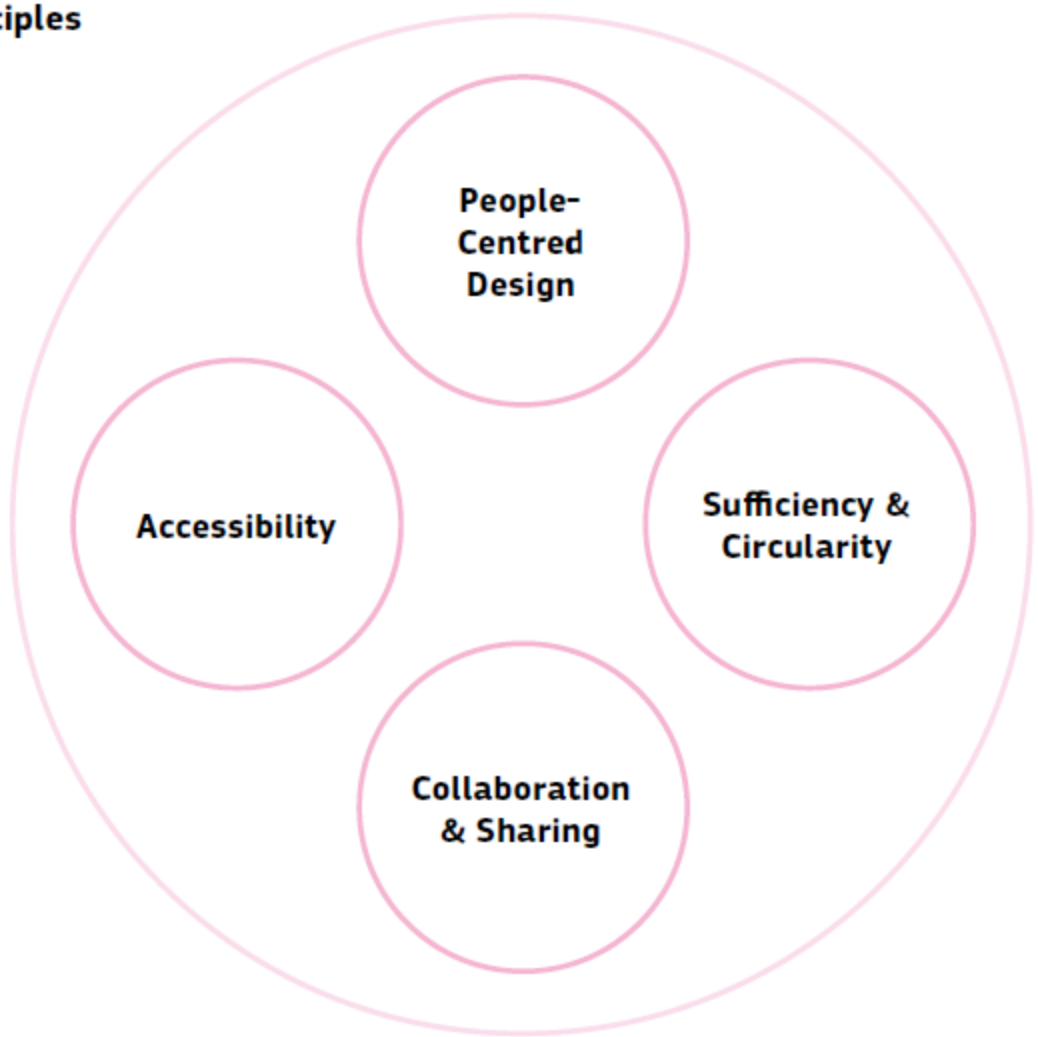
Trust
Transparent communication about deployment
Safeguarding user privacy
Ensuring reliable services

Fairness & equality
Access to all, especially to marginalised groups & remote areas

Power & sovereignty
Supporting local decision-making & ownership structures;
Reducing reliance on external tech providers

Care
Designing & deploying tech in a way that nurtures the well-being of inhabitants & natural environment

Principles



Collaboration & Sharing

Involves farmers, rural communities, the private sector, governments, and tech companies working together. This can be achieved through forming networks, sharing knowledge, data, practices, tools, and infrastructure, as well as promoting cross-border networking and collaboration.

Accessibility

Ensuring accessibility and affordability of digital technologies and services to all farmers and rural communities, regardless of their location, income, or the size of their operation.

People-Centred Design

Factoring the needs and preferences of farmers and rural communities in the development of digital tools and services through an iterative process of user feedback and design.

Sufficiency & Circularity

Ensuring that digital technologies are environmentally, socially and economically sustainable, durable, open for modification, recyclable, and are used frugally.

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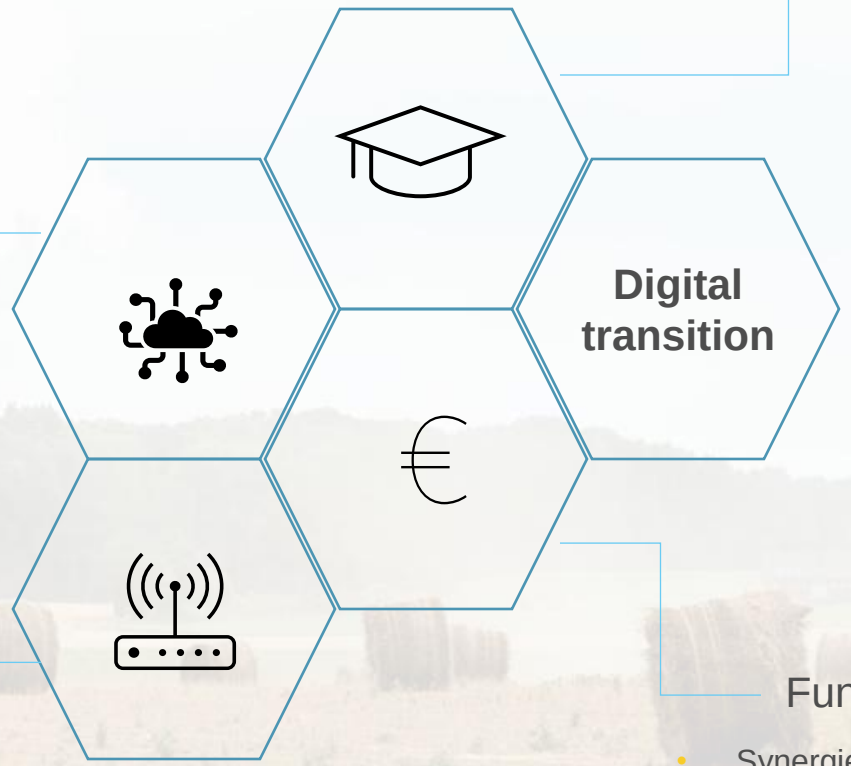
Enablers for digital transition

Capacity building

- Coordinated approach to education, training & life-long learning

Digital ecosystem & governance

Dynamic & adaptive regulatory environment (data protection, privacy & cyber security)



Infrastructure & connectivity

- Physically robust & secure infrastructure & hardware/software

Funding & investment

- Synergies between funding schemes & measures
- Public-private partnerships

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Recommendations

Adoption of technology: vision & broader implications of connectivity

Policies to support flexibility & diversity of digital solutions

Governance framework at the EU level

EU digital transition strategy

+ MS/regional/local strategies

A collaboration between Foresight & Design for Policy

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The toolkit can help you to:

Uncover key issues for Vision & Strategy

Engage Stakeholders

Future-Proof your Strategy

Set or revise Objectives, Milestones & Action plans

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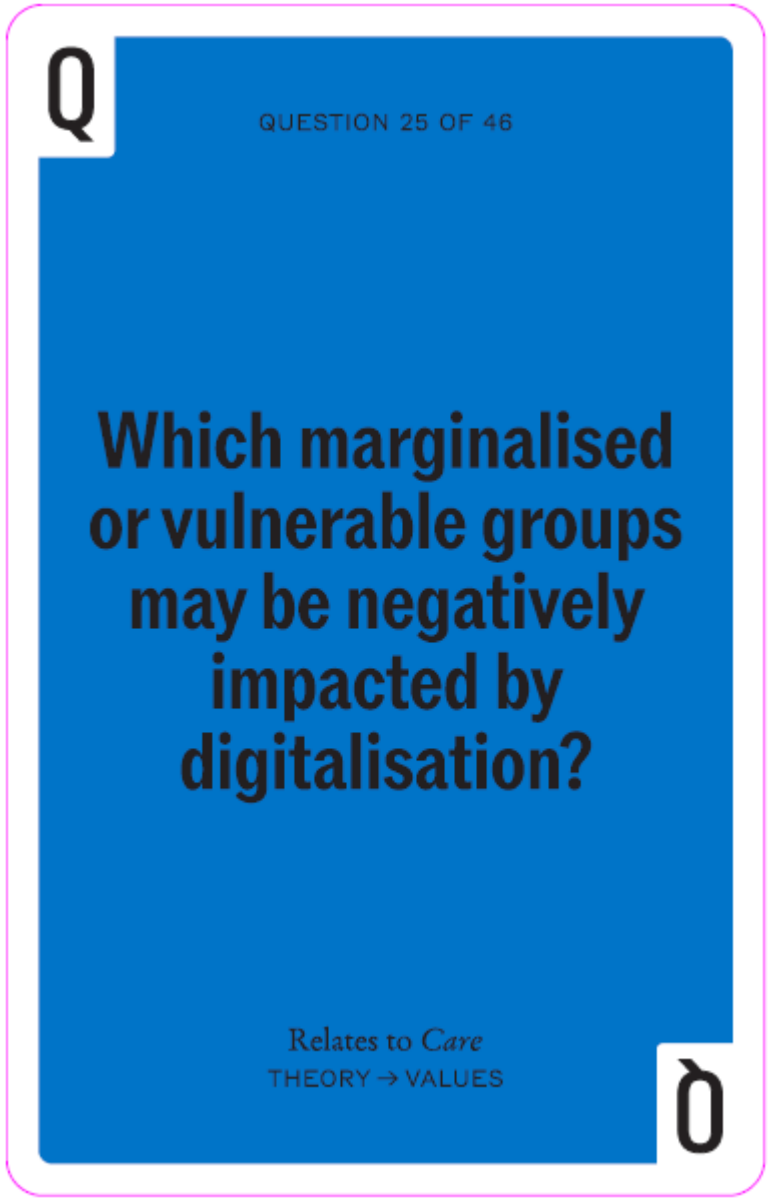
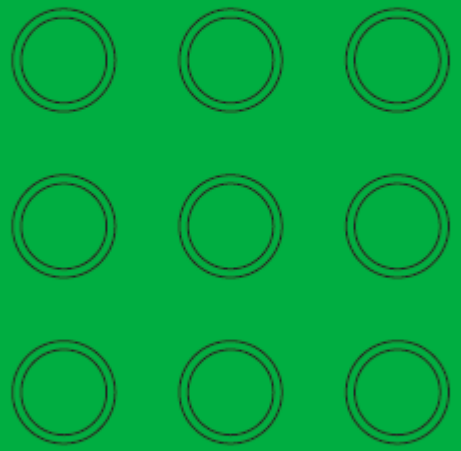
Q
QUESTION 40 OF 46
What are the main barriers in infrastructure and connectivity in our area?
THEORY → ENABLERS
Q


Q
QUESTION 25 OF 46
Which marginalised or vulnerable groups may be negatively impacted by digitalisation?
Relates to Care
THEORY → VALUES
Q

A

ACTIVITY 1 OF 5

Map out key actors and stakeholders in your digital ecosystem



Position the relevant *actor-cards* on the flipchart.

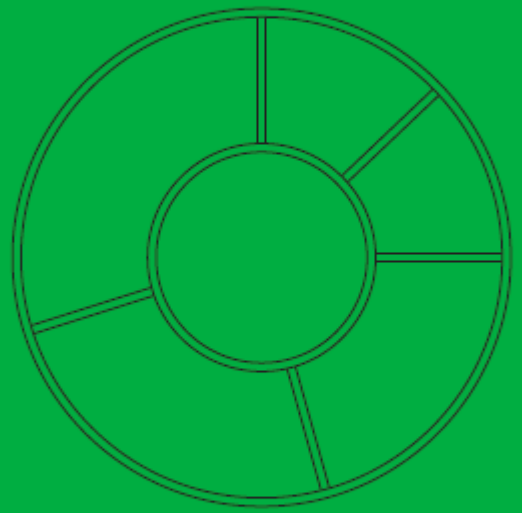
PRACTICE

A

A

ACTIVITY 5 OF 5

Allocate budget for your digital transition strategy



Allocate amounts for e.g. capacity building; *infrastructure and connectivity*; *digital ecosystem* and/or *data schemes*; *collaboration and networking*; *research* and *development*.

PRACTICE

A

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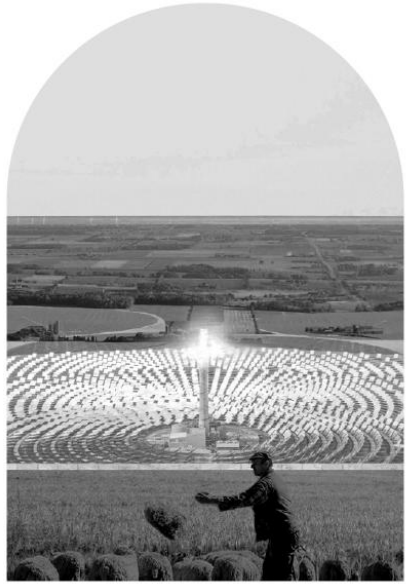
What are the risks for our digitalisation strategy across the four scenarios? How can we mitigate them?

SCENARIO 1 OF 4

Navigating Storms



SCENARIO 2 OF 4

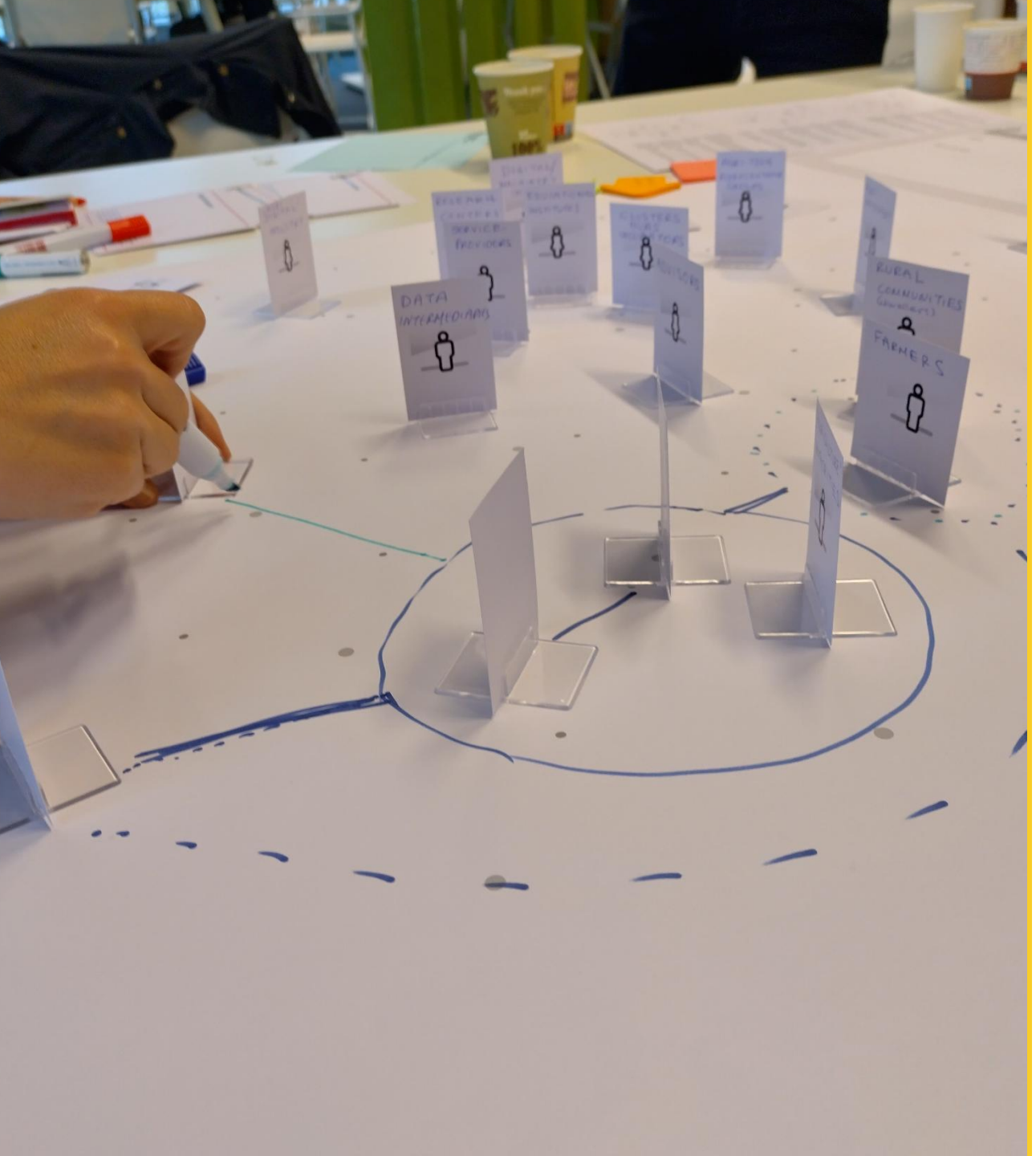
Community Revival Amid Technological Collapse

SCENARIO 3 OF 4

Reclaiming Digital Sovereignty

SCENARIO 4 OF 4

Resilient Roots to Withstand the Shocks



Interested to use the toolkit?
Get in touch:

jrc-foresight@ec.europa.eu

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Keep in touch

https://policy-lab.ec.europa.eu

European Commission

Keep in touch

EU Policy Lab: policy-lab.ec.europa.eu

EU Science Hub: ec.europa.eu/jrc

@EU_ScienceHub

EU Science, Research and Innovation

Conclusions - Next steps for an EU strategy

- Toolkit-based workshops with AGRI colleagues and Member States
- Development of vision and strategy at EU level
  - Roadmap
  - Coordination/Governance
  - Roles and responsibilities
  - Resources
  - Linkage with CAP & Long-Term Vision on Rural Areas

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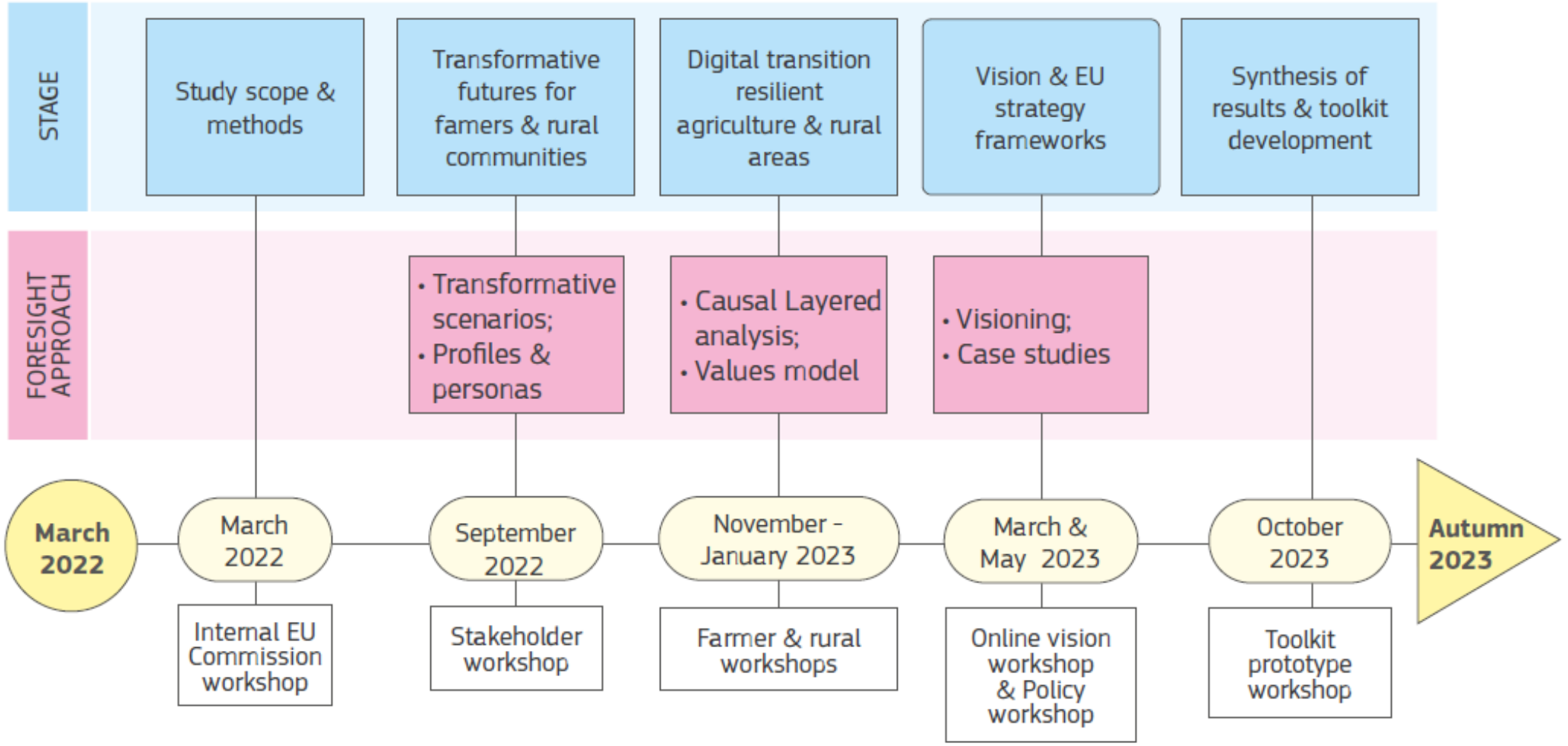
Overview of the foresight process



Transformative futures 2040

Starting point

- Staple food & energy
- Self-sufficiency
- Land competition

- Food monopolies
- Rural depopulation
- GMOs & synthetic foods

- Large corporate monoculture farms
- Technocratic governance
- Sustainability initiatives compete

- Sustainable & circular agri-food
- Alternative proteins gain traction
- Thriving rural areas

Wild cards

Transformation

- Food supply chain disruptions
- Self-governing food & energy networks
- Open-source low tech solutions

- No-tech & low input production
- Shorter supply chains
- Autonomous self-sufficiency approaches at local/regional level

- Struggling corporate farms
- Peer-to-peer farmer communities using digital tech
- Better pay for manual workers

- Low-tech regenerative farms mitigate tech failures
- Re-orientation of green tech to EU
- Strong ties & diversified agri help to avoid conflicts

[Link to the conference materials]

New roles for people & technology

Tidal Energy Producer

Sara, female, 28

Idal power plant technician working in a growing local sector in her hometown; maintains and repairs equipment in a challenging environment, often during extreme weather conditions.

Augmented reality nature teacher/guide

Keith, male, 52

School teacher with a degree in sustainable development and future-oriented education; conducts virtual field trips to wilderness areas for students and digital tourists; based in a remote wildlife-rich area.

Circular Economy Enabler

Tom, male, 31

He links businesses, farms, public canteens etc to develop circular economy projects in an area.

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Key takeaways

Coping with shocks

Managing risks → predict – forecast – warn

Wisdom

Good judgment → complexity of information and systems - risk of digital inequalities

Community

Social ties → engagement in decision making, social integration & well-being

Preventing transfor-mation

New dependencies & vulnerabilities, data power game→ contingency for service interruptions

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Lessons on digitalisation in Smart Villages

Edina Ocsko

BCO Session, 25 march 2025

Context & background

- E40 was coordinator of the EU-funded **Smart Rural projects** (SR21 and SR27) between 2020-2024
- E40 has been **Coordinator of the Smart Village Network** since 2018
- E40/ Smart Village Network Services is member of the **EU's Rural Pact Coordination Group**

What will I talk about

- What we have done in the Smart Rural projects in relation to ‘digitalisation’
- Examples of Smart Villages and digitalisation
- What lessons we have learnt

Smart Rural 21

To support rural communities in developing Smart Village Strategies and implementing smart actions (including renewable energy, digital services, local entrepreneurship, etc.)

Smart Rural 27

To prepare Member States and rural communities for the **implementation of the CAP post-2020** and other policies and initiatives which could potentially support the emergence of Smart Villages across the EU.

Examples

- **Torup (Denmark)** – Digital platform for exchanging ‘tools and talents’
- **Stanz (Austria)** – Blockchain technology in Renewable Energy Community

Torup: Tools & Talents (2022)

Lessons from Torup, Denmark

https://www.smartrural21.eu///wp-content/uploads/White-Paper-Developing-a-digital-solution-5.pdf

You always need to think carefully what the real needs of community members and who the potential users are…

"In the Tools & Talents project, we had a clear idea who the users were. At least we thought we had." (White Paper)

Tool developed in close working with community leaders, however …

"It was actually first when the platform was almost completed that the involvement with the inhabitants of the village started." (White paper)

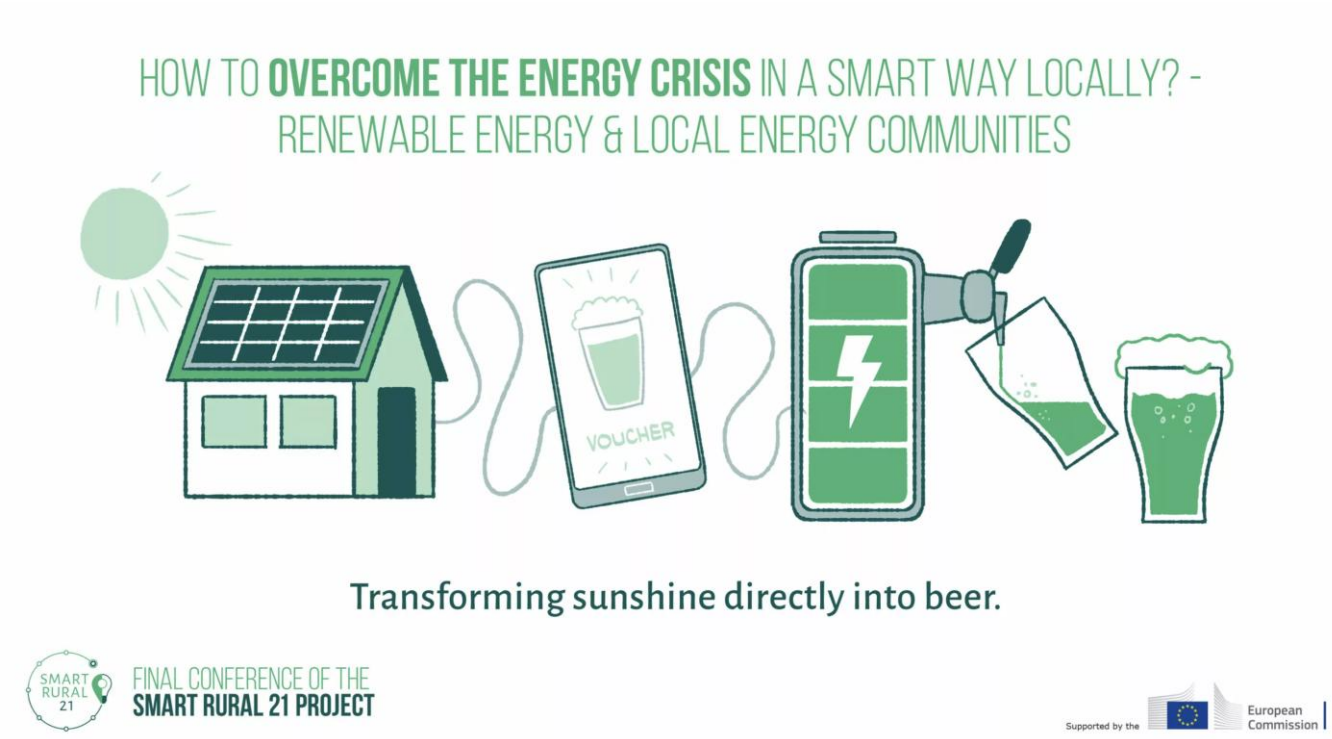
- White paper with many practical tools and lessons on how to develop new IT tools
- The digital tool (website & App) was successfully developed and used for a number of years…

3 years later…

- Continued in a much simpler form / new website
- The idea ‘survived’ but not the initial IT development.
- Additional funding secured.
- Inspired a Danish Foundation to stimulate similar sharing projects.

Renewable energy community – Stanz (Austria)

- Use of blockchain technology for local renewable energy community.
- Considering a token system linked to this (SR21 feasibility study).



Lessons from Stanz, Austria

- The focus has been on setting up the REC.
- Technology is just a 'tool' – but an important one - for this.
- Technologically much more complex, careful consideration before launching (feasibility).

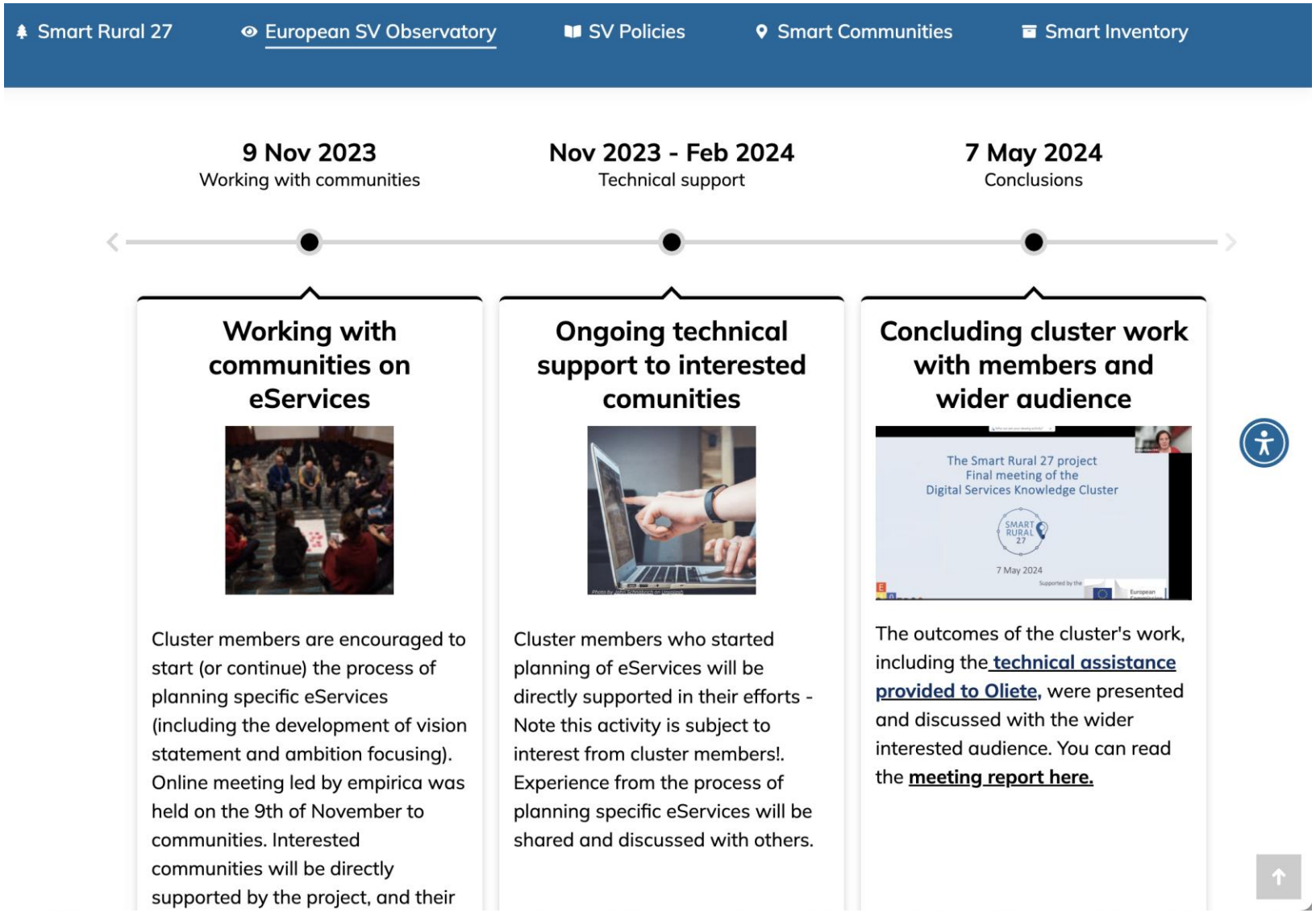
3 years later…

- In the test-phase of technology: Actual energy trading between three households

"That's good, because we can learn a lot from the problems that others have had in the early stages." (F. Pichler, former Mayor)

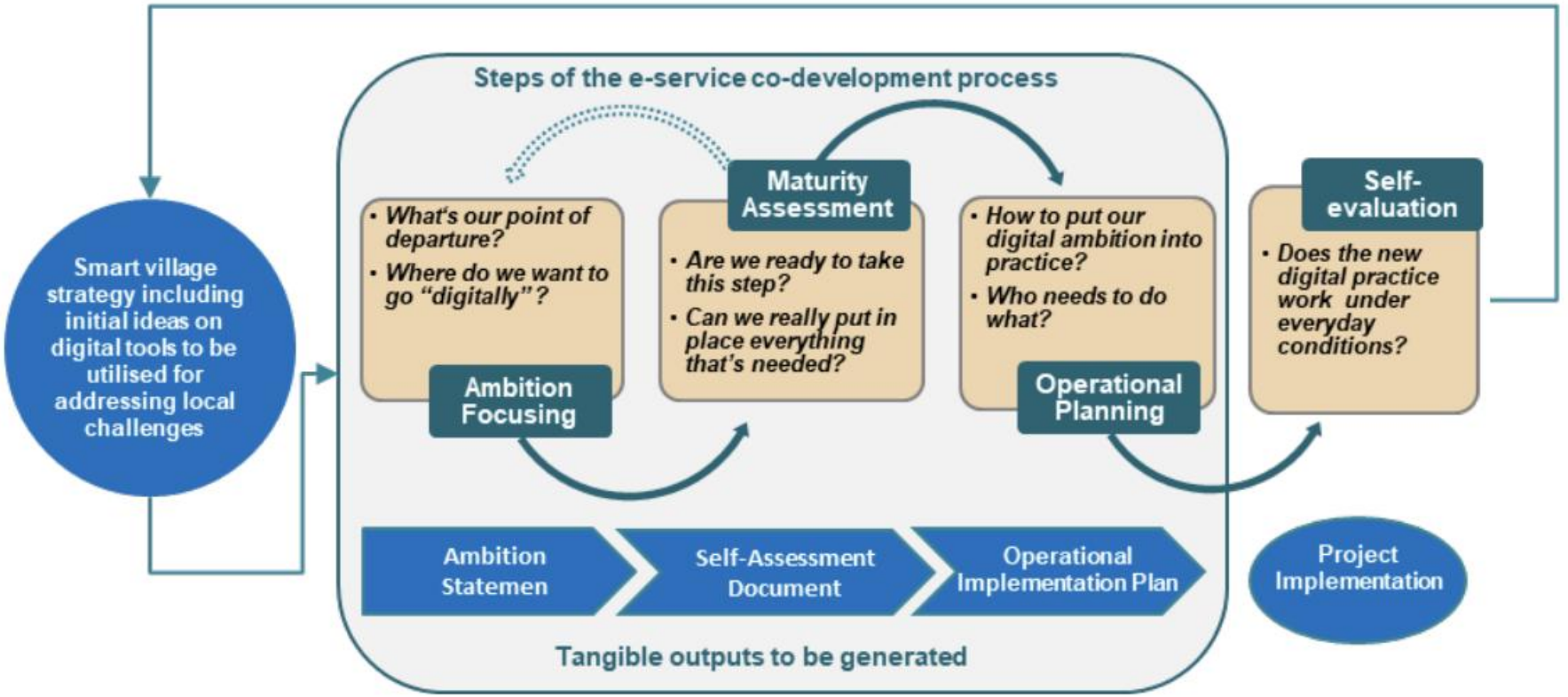
- 9 households are currently connected to the blockchain pilot project, which is ready to start.
- 'Energy Agent' hardware and APP installed to monitor, control, optimise energy flows, including token system.
- Proof of blockchain technology innovation (concept).
- Currently 82 REC members. In April, some 100 metering points expected among members.
- Realtime test of token system with selected members.

The knowledge cluster on digital technology (SR27)



Process of digital service development:

Ambition focusing – Maturity planning – Operational planning



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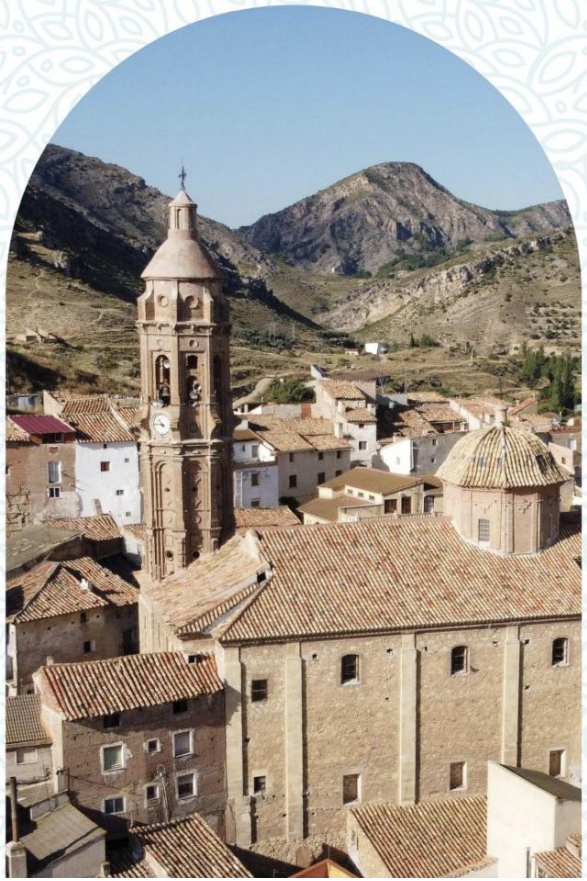
Example of Oliete, Spain:

Guided process for developing a digital solution for the new e-bike system



Oliete, Teruel, Aragón, Spain

350 inhabitants

Tackling depopulation through social, regenerative and digital approaches.

SMART RURAL 27

Apadrinaunolivo.org

Despertadores Rurales Inteligentes

Lessons from Smart Rural projects:

Digitalisation with an impact is a longer journey then often expected

- Large interest in the topic and high hopes.
- When it came to realising concrete ideas (community engagement, etc.) the capacity to get involved was much more limited – Need to discern 'hype' from 'reality'.
- Need to combine the use of technology with innovative non-technological practices (collaborations, business models, etc.).
- Time and effort for technological and social processess is often underestimated.

Next steps… The Smart Village Network

- The Smart Village Network **continues to support exchanges and mutual learning** among rural communities, digitalisation remains one of the key themes.

We aim to:

- create meaningful linkages between the needs of local rural communities and technological companies with relevant solutions.
- Identifying funding opportunities in response to the needs of local communities.

info@smart-village-network.eu