

Co-producing SSP-based socioeconomic extensions to inform planning for regional climate change in Finland

A systems-based approach to SSP-based narrative construction

Anna Lipsanen with collaborators*

FINSCAPES Final Seminar
24th of October 2024

*Fagerström, Stefan; Saastamoinen, Uula; Korhonen-Kurki, Kaisa; Saarela, Sanna-Riikka; Carter Timothy R. (Syke); Kautto, Niina; Rimhanen, Karoliina; Sorvali, Jaana (Luke); Myllynen, Matti (Lund University); Ruuhela, Reija (FMI)



Suomen ympäristökeskus
Finlands miljöcentral
Finnish Environment Institute

The FINSCAPES project



Finnish Scenarios for Climate Change Research
Addressing Policies, Regions and Integrated Systems



Co-creation goals, with regional partners:

- 1) **A new scenarios framework and methodology** for climate change analysis in Finland
- 2) **Regional socioeconomic pathways** for societally-relevant systems based on global SSPs
- 3) **Regional climate projections** of relevance, including climate and impact storylines
- 4) **Integrated scenarios** for Finnish sub-regions and nationally, combining socioeconomic pathways and climate projections
- 5) **Practical demonstrations** of scenario application
- 6) **Effective dissemination** to a wide variety of potential users

Duration: 2021 – 2024

Funding: Academy of Finland

Partners: Syke, Finnish Meteorological Institute, Luke



Timothy Carter



Kirsti Jylhä



Taru Palosuo

Shared Socioeconomic Pathways (SSPs)

- Five alternative, global characterisations of possible societal futures
- Quantitative & qualitative components
- Describe the evolution of society through the 21st century
- Alternative views on the scale of the challenges of climate change mitigation and adaptation



The roads ahead: Narratives for shared socioeconomic pathways describing world futures in the 21st century

Brian C. O'Neill ^{a,*}, Elmar Kriegler ^b, Kristie L. Ebi ^c, Eric Kemp-Benedict ^d, Keywan Riahi ^{e,f}, Dale S. Rothman ^g, Bas J. van Ruijven ^h, Detlef P. van Vuuren ^{h,i}, Joern Birkmann ^j, Kasper Kok ^k, Marc Levy ^l, William Solecki ^m

^a National Center for Atmospheric Research (NCAR), PO Box 3000, Boulder, CO 80305, USA

^b Potsdam Institute for Climate Impact Research, PO Box 601203, 14412 Potsdam, Germany

^c University of Washington, Seattle, WA, USA

^d Stockholm Environment Institute, 15th Floor, Witthayakorn Building, 254 Chulalongkorn University, Chulalongkorn Soi 64, Phayathai Road, Pathumwan, Bangkok 10330, Thailand

^e International Institute for Applied Systems Analysis, Laxenburg, Austria

^f Graz University of Technology, Graz, Austria

^g Frederick S. Pardee Center for International Futures, Josef Karbel School of International Studies, University of Denver, 2201 South Gaylord Street, Denver, CO 80208-0500, USA

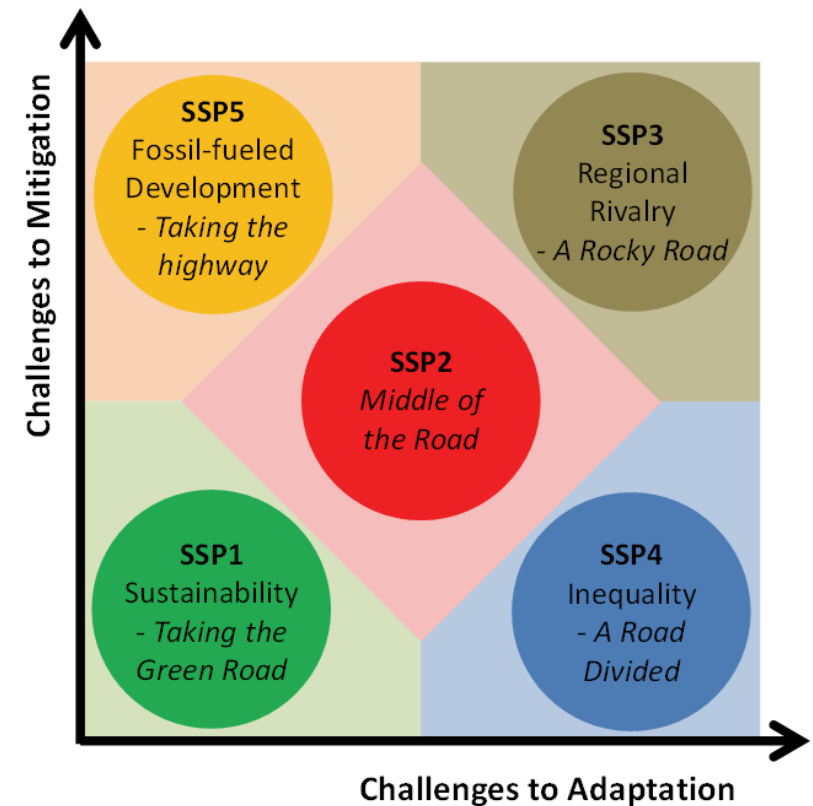
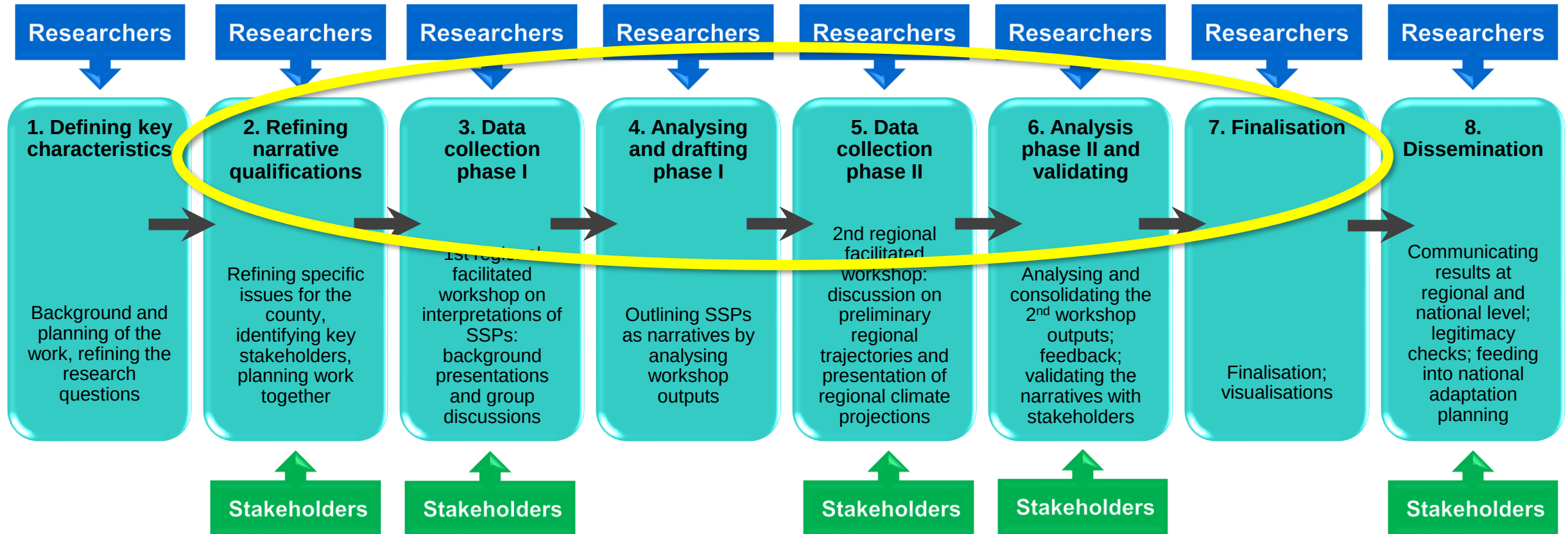


Figure 1. Shared socioeconomic pathways (SSPs) (based on O'Neill et al., 2017 and Frame et al., 2018)

- **SSP extensions** – a detailed regional/sectoral view of future developments
- Methodological challenges e.g.:
 - Interpreting global narratives at regional level
 - Co-production with stakeholders

Co-production of SSP narratives / Process design



2. Refining narrative qualifications / Regional focus & system-based approach

Regional selection

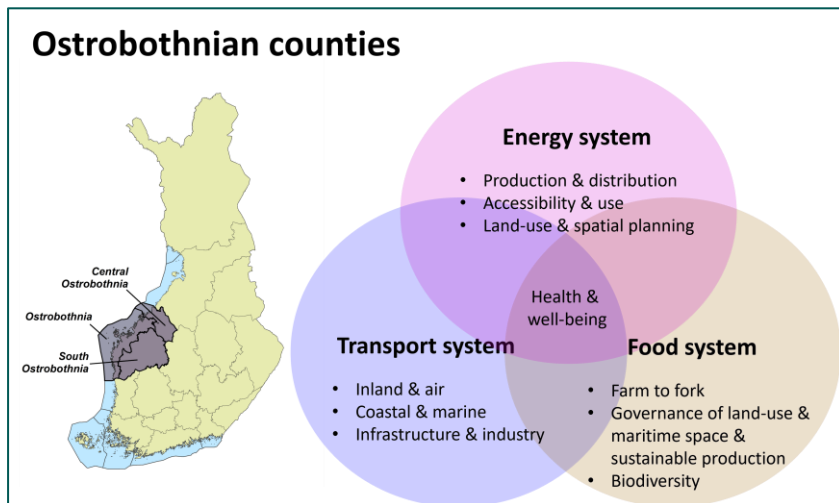
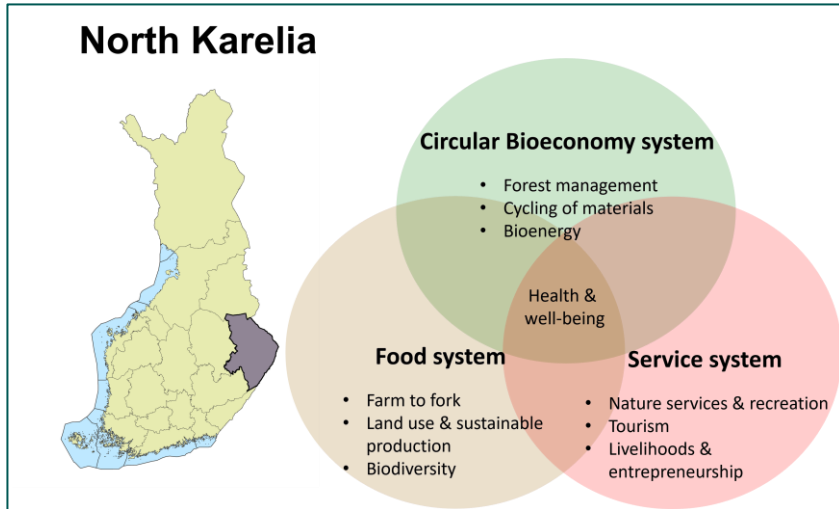
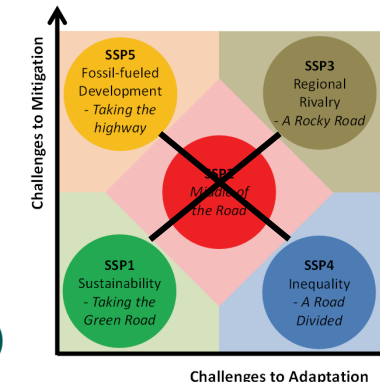
- Many regions interested in scenario development
- North Karelia and Ostrobothnian counties selected due to their current climate activity needs and collaboration opportunities

System selection

- Systems recognised to cover multiple relevant sectors by combining them onto key systems of importance regionally/nationally
- Key systems for the regions selected together with regional council members
 - Included preparatory meetings and a survey on regionally relevant sectors (and systems) and pre-identified climate related risks

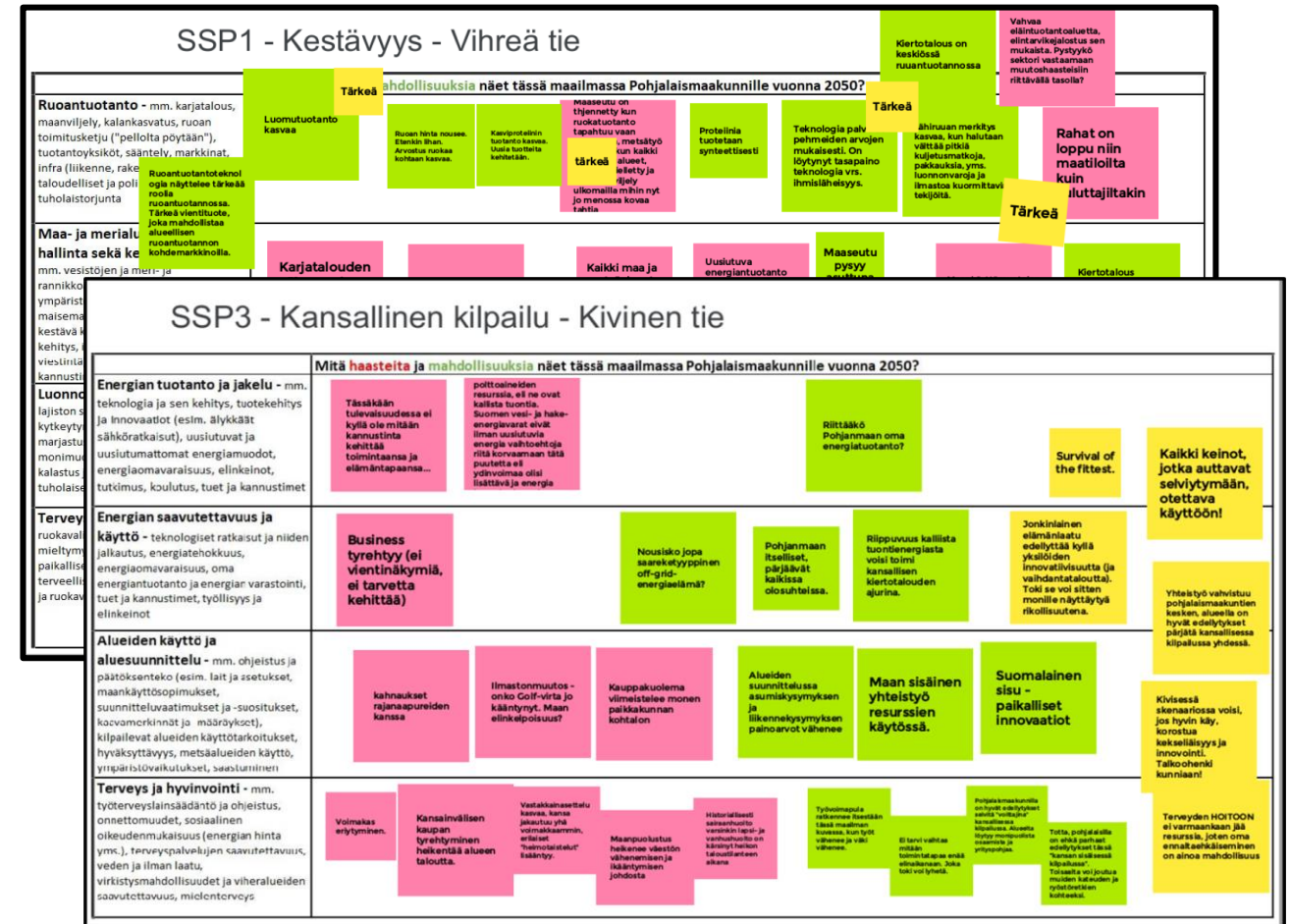
SSP extensions for FINSCAPES

- Based on key systems
- Finnish language equivalents
- Four SSPs (excluding SSP2)
- Time horizon ~2050 (mid-century)



3. Data collection phase I / Workshop I

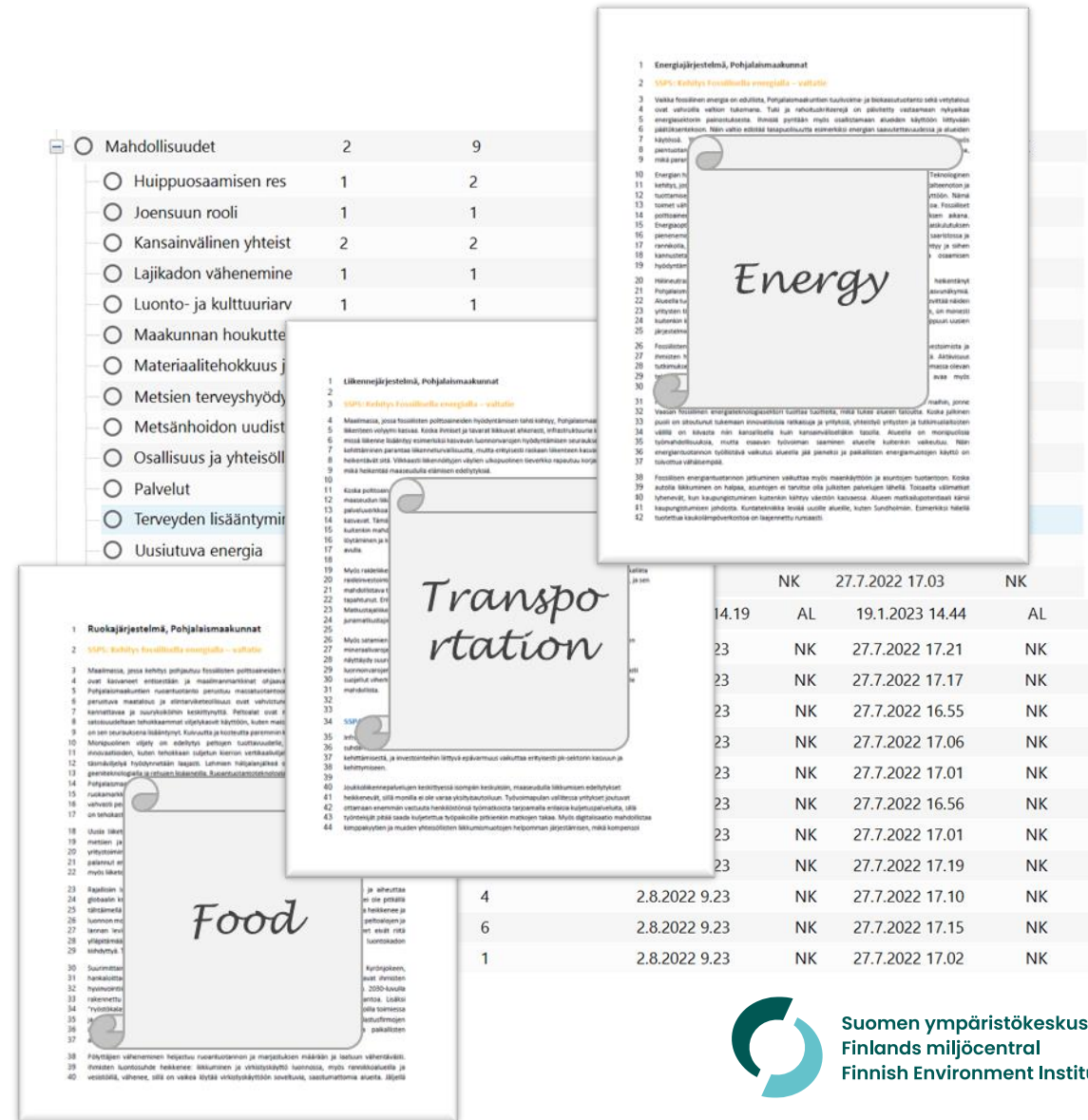
- Organised **remotely** as 5-hour workshops on Teams on 10th and 16th of February 2022
- Language Finnish
- Stakeholder participants
 - Ostrobothnia: 39
 - North Karelia: 26
 - Representatives from e.g. municipalities, ELY Centers, NGOs etc from different sectors/systems
- Work done in three breakout groups based on systems
 - Jamboards and discussion
- Four SSPs
 - SSP1, SSP3, SSP4 and SSP5
 - Each SSP session started by presenting the SSP in question



What challenges and opportunities do you see in this (SSP) world in your region in 2050?

4. Analysing and drafting phase I (1/2)

- Jamboards and transcribed breakout group discussions coded into NVivo (qualitative analysis tool)
- Materials coded for each system and SSP per region
 - Specific themes into either challenges or opportunities (or both if ambiguous)
 - Multiple coders and coding phases, including consistency checks
- Interim results:** Draft narratives for each system and SSP for both regions
 - Energy, food and transportation system narratives for Ostrobothnia
 - Circular bioeconomy, food and service for North Karelia
- Stakeholder feedback gathered on draft narratives through a Webropol survey



4. Analysing and drafting phase I (2/2)

Challenges how to combine and merge the system narratives into regional ones...

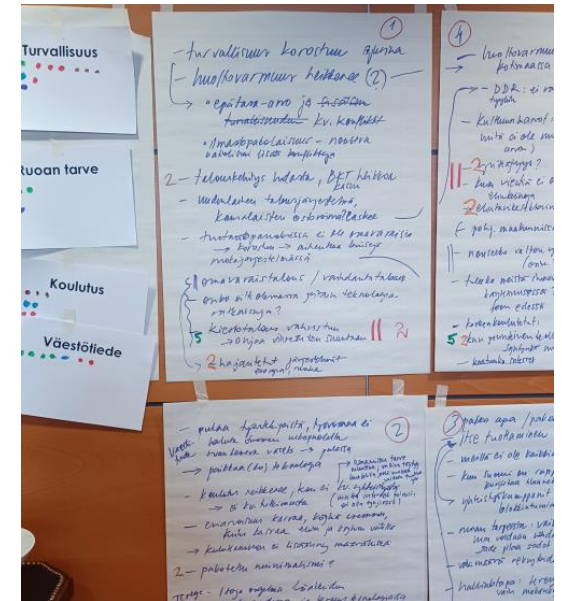
- **A set of 12 drivers** identified based on WS1 discussions, system narratives and scientific literature
- **Common to all SSPs and systems** in both regions
- **Highlights connections** between systems and drivers
 - Some drivers are more relevant for one system/region than another
- **Creates a framework** to combine system narratives into regional narratives
- **System narratives re-coded** based on drivers
 - Preparation for workshop II

Codes

⊕	Name	Files	References
⊖	⊙ Energia ryhmä1 SSP5 pohja	2	68
	⊙ Energia (Energy)	2	18
	⊙ Hallintotapa (Governance)	2	11
	⊙ Infrastruktura (Infrastructure)	2	2
	⊙ Kaupungistuminen (Urbaniz	1	2
	⊙ Koulutus (Education)	0	0
	⊙ Kulttuuri ja arvot (Culture an	1	1
	⊙ Ruoka (Food)	2	6
	⊙ Talous ja elinkeinot (Econom	2	11
	⊙ Teknologia (Technology)	2	6
	⊙ Turvallisuus (Security)	1	1
	⊙ Väestötiede (Demographics)	2	5
	⊙ Ympäristö ja luonnonvarat (E	2	5

5. Data collection phase II / Workshop II

- One-day on-site workshops in both regions on 12th and 20th of September 2023
- Stakeholder participants
 - Ostrobothnia (Seinäjoki): 15
 - North Karelia (Joensuu): 7
- The aim to collect necessary (additional) information to construct regional SSP-based narratives
- Information leaflet on drivers and SSPs for stakeholders to use as aid at the workshop
- Tasks:
 - Feedback on system narratives (morning session)
 - Identify and prioritise 6 key drivers for each SSP from the set of given drivers
 - Discussions on the evolution of the drivers and their impacts on the region in different SSP futures
- A professional facilitator helped to run the workshops smoothly

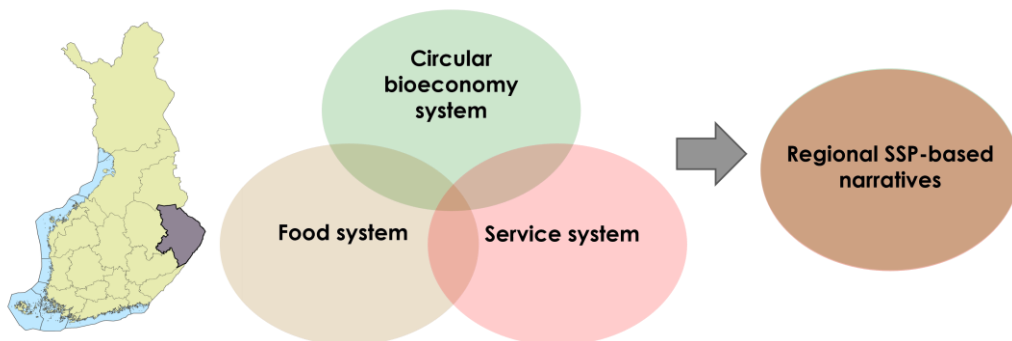


Photos by Niina Kautto & Kari Kukkola

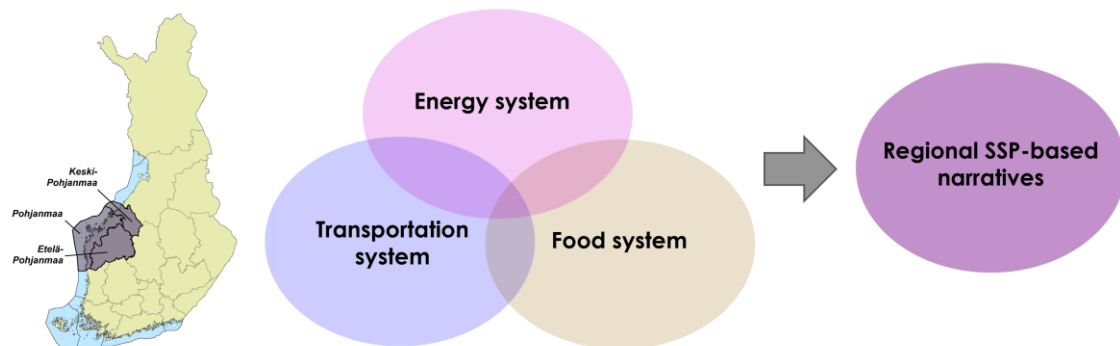
6. Analysis phase II and validation

- Feedback and material from WS2 used to merge interim narratives into **regional SSP-based narratives**
 - Consolidation and writing
- Target length ~ 3 pages per SSP
 - Narratives categorised by key drivers: Society & Culture; Economy & Livelihoods; Energy Production, Technology, and Infrastructure; Environment and Natural Resources
- Stakeholders from WS2 received the draft regional narratives for final comments via Webropol survey in December 2023
 - Feedback given by 10 stakeholders
- Narratives finalised and finetuned after final feedback round

North Karelia

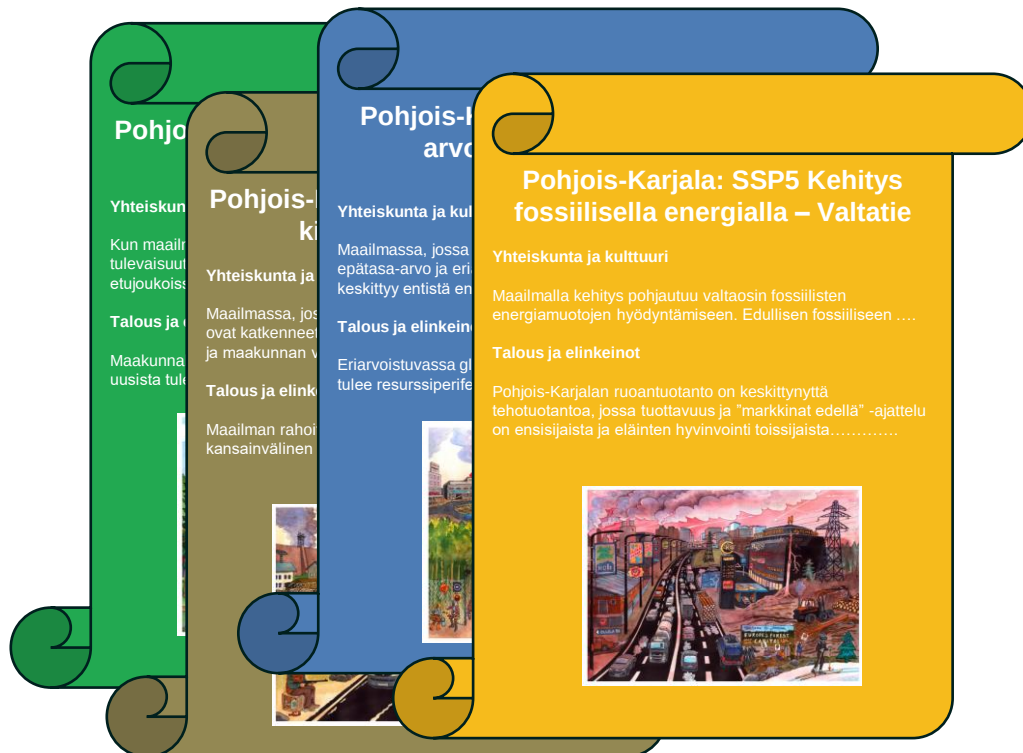


Ostrobothnian counties



7. Finalisation / Results

- Four narratives (SSP1, SSP3, SSP4, SSP5) per region (2-3 pages per SSP); language FI and EN
- Summary narratives (~half a page/SSP) prepared based on the full-length ones



- Final narratives professionally copy edited and visualisations prepared...

7. Finalisation / Visualisations

- Local artists selected for preparing illustrations
 - Sanna Hukkanen for North Karelia
 - Ilpo Koskela for Ostrobothnian counties
 - Based on the artists' preferences, different techniques were used:
 - Hand drawn images for North Karelia
 - Digital Art technique for Ostrobothnia
- Guidelines for the artists:
 - A brief context of SSPs and the process of regional extensions was given
 - One image per SSP per region based on the full-length narrative
 - General guideline to follow the narrative description *but* artistic interpretation was encouraged
 - One commenting round for the early drafts
 - Illustrations designed to be used together with the narratives to provide the context

Visualisations North Karelia

SSP1



SSP3



SSP4



SSP5



Visualisations Ostrobothnian counties

SSP1



SSP3



SSP4



SSP5



Next steps...

- Final products (regional SSP-based narratives and visualisations) to be published:
 - Results available on the FINSCAPES website (www.syke.fi/hankkeet/finscapes)
 - For each region, a summary document of key FINSCAPES results in Finnish by the end of year 2024
- Scientific reporting
 - Process and results reported as two scientific articles in international journals
 - First paper on the methodology and its operationalisation
 - Second paper on analysing the narratives and their applicability; key indicator selection?; comparison between regions?
 - Both articles under preparation

Take home messages

To conclude...

- **Novel system approach** to extending SSPs: **drivers key** for prioritising the material and creating a common ground for narrative writing -> consolidating systems into regional SSP based narratives
- **Co-production** process: **stakeholder input crucial** for producing and validating the results for regionally relevant narratives but **process is time consuming and resource intensive** for both stakeholders and researchers
- **Integration of scenario elements**: Socioeconomic narratives can be combined with climate projections to scrutinise **how a certain climate affect society in a specific future**
- Regional socioeconomic narratives describe important factors affecting the exposure and vulnerability of local systems and people to impacts of climate change – but **how to use this information for policies and actions that are required for climate change mitigation and adaptation?**

Thank you for your interest!



Contact: anna.lipsanen@syke.fi or stefan.fagerstrom@syke.fi

Project website: www.syke.fi/projects/finscapes



Suomen ympäristökeskus
Finlands miljöcentral
Finnish Environment Institute