

Projects funded under the call ‘Special funding for system-level research into climate change mitigation and adaptation’

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

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The FINSCAPES project aims to develop new integrated scenarios of socioeconomic and climate change during the 21st century for use in climate change research and policy making in Finland. In close collaboration with stakeholders of key societally relevant systems, it co-produces national and regional socioeconomic narratives as extensions of global shared socioeconomic pathways (SSPs). Using recent global climate model simulation results, a set of national and regional future climate projections will be prepared, with new analysis on extreme weather and compound events and preparation of climate and impact storylines. Narratives and climate projections are combined into integrated, system-wide SSP-based scenarios for Finnish sub-regions and nationally. Design, development and application of the scenarios are demonstrated in case studies of relevance for research and policy. Emphasis is placed on effective dissemination of project outcomes at regional, national and international level.

Sustainable Climate Change Mitigation Strategies in Energy-Land-Material Systems (SuCCESs)

Ekkholm, Tommi: Finnish Meteorological Institute; Saikku, Laura: Finnish Environment Institute; Uusivuori, Jussi: Natural Resources Institute Finland

Current understanding of how global energy, land use, and materials systems ought to be transformed to limit warming to 2°C is shaped by Integrated Assessment Models (IAMs). IAMs jointly depict the global economy and the climate system and enable the optimisation of climate policy. Several current IAMs describe the energy system in detail but do not sufficiently account for its links with land-use and materials systems. Hence, mitigation strategies derived using these models may not be attainable (if material constraints of transforming the energy system are violated), cost-effective (if land ecosystems’ carbon sequestration potential is not fully accounted for), or sustainable (if mitigation measures violate other planetary boundaries, e.g., push deforestation beyond a tolerable threshold). We examine how modelling the energy-land-materials system in detail changes the global mitigation strategy, and how following this strategy affects the land use and energy sectors in Finland.



Learning of the Competencies of Effective Climate Change Mitigation and Adaptation in the Education System (ClimComp)

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In this study, we examine what are the competencies needed in the society to efficiently mitigate and adapt to climate change and how these competencies are learned and taught throughout the education system. Climate expertise is urgently needed in all sectors of the society. We propose that in active collaboration with the state-of-art research, education system as well as society, optimal learning moments are created and climate competencies are learned. In collaboration with atmospheric scientists, climate modellers, educational scientists and psychologists we study optimal learning moments in project-based learning, research-practice partnership as well as online learning environments among youth. As a result, we propose systemic changes to the education system to better teach and learn the climate competencies and develop new tools for youth to learn climate change competencies.

ICT for Climate Actions (ICA)

Manner, Jukka: Aalto University; Porras, Jari: LUT University; Syri, Sanna: Aalto University

ICT technologies have had a huge positive impact on our fight against global warming by resource efficiency, optimised industrial processes, remote meetings and smart energy systems. Yet, the ICT sector is a large consumer of energy to power the data centres and networks and uses rare earth minerals in device manufacturing. Resource usage of ICT is rather hidden from end users. The ICA-project studies this complex system. We seek to understand the real, measurable ICT growth trends and how this affects the need for energy. We study ways to lower the impact of the sector on the delivery of services and to contribute towards sustainable societies. Here the focus is on reusing the excess heat emerging from data centres and communication equipment (like 5G base stations), and on designing more lightweight Internet services. We also seek to raise awareness and empower and engage the various stakeholders to better understand the situation and minimise the impact of ICT on global warming.

Sustainable and Healthy Buildings in the Changing Climate: Balancing Costs and Benefits (BALANCE)

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Among the most impactful ways to combat climate change in Northern countries is to reduce CO₂ emissions from buildings by adding insulation and optimising ventilation.

However, such mitigation strategies can negatively impact indoor air quality and further increase risk of moisture damage, which is predicted to increase due to climate change and has been identified as one of the five major threats to health in Finland due to climate change.

We aim to identify the most cost-efficient intervention strategies in the Finnish building stock by modelling the effects of climate change and energy efficiency interventions on the carbon footprint, on



moisture damage risk and other effects on indoor air quality, on building occupants' health, and on associated costs. We will apply this model to the entire Finnish building stock, considering different climate change scenarios up till 2050 and 2080.

Facing Systemic Change Together: Citizen Deliberation in Informed and Just Climate Transitions (FACTOR)

Setälä, Maija: University of Turku; Ikävalko, Johanna: Finnish Meteorological Institute; Kyllönen, Simo: University of Helsinki; Saarikoski, Heli: Finnish Environment Institute; Soini, Katriina: Natural Resources Institute Finland

FACTOR explores ways in which citizen deliberation can facilitate just and informed transition processes. FACTOR analyses various obstacles for an agreement on climate justice, including individual biases and misperceptions, and how deliberative processes can potentially counteract them. FACTOR organises deliberative mini publics to help citizens and policy makers make informed and balanced judgments on climate transitions. At the regional level, three Citizens' Juries are organised to deliberate on regional road maps for climate transitions. A Deliberative Citizen Panel is organised online at the national level. Its task is to develop the ways in which climate information is presented at the Climateguide.fi portal. FACTOR conducts surveys and interviews as well as field experiments to gauge the effects of deliberative citizen participation among policy makers and the public at large.

FoodStep – A Sustainable Model for Food Services and Early Childhood Education and Care

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Transformation towards a more climate-friendly and healthy sustainable diet will require major changes in the food system: increase in consumption of plant-based foods and only moderate consumption of animal-based foods. In the FoodStep -project, we will develop a sustainable model for food system that reduces the climate impacts of the food system in early childhood education and care. The impact of the changes on children's nutrition, the climate impact of the diet, and the cost of food services will be assessed in a randomised controlled trial. In addition, the effects of the model on the knowledge and attitudes of decision-makers, experts in food service and early childhood education, and families are studied. Based on the project, the model can be applied nationally as part of Finland's climate change mitigation and adaptation strategy. We aim to a sustainable food system reform through concrete guidelines, communication, and action initiatives.