

WorldTrans NEWS



April/2026/charlotte.stark@met.no

EU confirms: WorldTrans progress and scientific impact is strong

WorldTrans has successfully completed its 36-month review with the European Commission, receiving highly positive feedback across all scientific Work Packages.

Key results and progress from the first three years of the project were presented by WorldTrans different work package leaders.

Cecilie Mauritzen, project lead WorldTrans highlights the positive results.

“The feedback from both the EU Project Officer and the external reviewer was clear and consistent: WorldTrans is delivering strong scientific results and addressing critical challenges in integrated assessment modelling.”

Innovative approach highlighted

The project’s approach, combining climate, economic, and human behavioural dynamics within a transparent and feedback-rich modelling framework, was highlighted as particularly innovative and relevant for future research and policy development.

Importantly, the inclusion of human behaviour in climate modelling was singled out as a key contribution. This is an area of growing importance across European research programmes, and WorldTrans is seen as being at the forefront of this development.

The overall conclusion from the review is that the project is firmly on track.

Photo: From our workshop and stakeholder meeting in Brussels 2025. Photo: C ---->

The legacy

Looking ahead, the final phase of the project will place strong emphasis on scientific publications and dissemination. With a substantial body of results now emerging, WorldTrans is well positioned to contribute to the broader IAM and Earth system modelling communities, plus the upcoming IPCC 7th Assessment Report process

And Mauritzen concludes that the message from the review was both encouraging and motivating.

“The project has built a strong foundation, and its results are considered highly relevant for advancing the next generation of integrated assessment models”



<https://worldtrans-horizon.eu/>

RESEARCH HIGHLIGHTS

Progress from BUILDING FRIDA



BILLY

*Enhancing FRIDA's
functionality to
support publication*

The FRIDA model - continues to evolve as a fully integrated system linking climate and humans.

Recent developments include large-scale uncertainty analysis as well as feedback loop dominance analysis, allowing researchers to identify key uncertainties and policy leverage points.

This represents a major step forward in making integrated assessment models more transparent and analytically robust.

Progress from USING FRIDA



DAVID



ALEX

*Stakeholder mapping
and educational
activities for FRIDA*

The Interactive Learning Environment (ILE) and FRIDA toolbox are now being actively used across a wide range of users, including students, decision-makers, and citizens.

More than 30 use cases have been conducted, transforming FRIDA into a tool for interactive learning and co-creation rather than a traditional "black box" model.

From development to application: Following earlier milestones - such as the rollout of the FRIDA dashboard, the ILE system, and stakeholder testing activities, the project is now entering a phase where scientific results, publications, and real-world applications take center stage.

RESEARCH HIGHLIGHTS

Progress from The NATURAL SYSTEM side

Significant progress has been made in representing climate damages and feedbacks across the human-Earth system.

New climate impact functions now capture effects across multiple sectors, showing how climate change can reduce economic output and alter long-term projections.

Recent work also highlights the importance of compound events and system-wide interactions, strengthening FRIDA's ability to represent real-world climate risks.



CHRIS



JANA

*Implementing the
damages resulting
from climate
change in FRIDA*

Progress from the HUMAN SYSTEM side

The FRIDA model continues to evolve as a fully integrated system linking climate and humans.

Recent developments include large-scale uncertainty analysis as well as feedback loop dominance analysis, allowing researchers to identify key uncertainties and policy leverage points.

This represents a major step forward in making integrated assessment models more transparent and analytically robust.



SIBEL



BIRGIT

*Developing FRIDA
and Felix from old
habits to the life we
live today and our*

Publications

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Schoenberg, W., Blanz, B., Breier, J., et al. (2025). *FRIDA v2.0: Modelling the two-way coupling of climate and humans*. International System Dynamics Conference (ISDC).

Eriksson, A. E., Gerten, D., Nilsson, L. J., et al. (2025). *Assessing planetary boundary transgressions using the FRIDA model*. EGU General Assembly, Vienna, Austria.

Wells, C., Smith, C., Blanz, B., et al. (2025). *Implementing global climate damage functions in a new integrated assessment model*. EGU General Assembly, Vienna, Austria.

Eriksson, A. E., et al. (2025). *Assessing planetary boundary transgression scenarios using FRIDA*. Scenarios Forum, Leeds, UK.

Wells, C., Schoenberg, W., Blanz, B., et al. (2025). *Integrating human-Earth feedback loops in the FRIDA model*. Scenarios Forum, Leeds, UK.

Eker, S. (2025). *Top-down modelling of social dynamics of low-carbon behaviour*. Aspen Global Change Institute Workshop.

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Why human behaviour is reshaping climate modelling

A central insight emerging from WorldTrans is clear; climate models must account for how people actually behave.

Traditional integrated assessment models often rely on simplified assumptions about human behaviour, typically driven by income and prices.

WorldTrans challenges this by introducing heterogeneous behaviour, capturing how social norms, lifestyles, and individual decisions evolve over time.

The results are significant, Sibel Eker (WP2 lead) points out.

“When behavioural dynamics are included, projections of food demand, energy use, and emissions change substantially compared to conventional approaches. Emissions are lower in most of the behavior-driven scenarios, not because of supply-side policies, but because people adapt their behaviour on the demand-side in response to changing social and environmental conditions.”

This work also highlights the importance of feedbacks between society, economy, and climate. For example, climate impacts can influence financial systems, income of households, and climate risk perception, which

in turn shape future decisions. One of our findings is that the scenarios with climate damages involve lower shifts to low-carbon lifestyles, even if there is stringent climate policy, because of the reduced incomes. In other words, economic damage caused by climate impact leads to lower incomes for households, which makes it harder to adopt low-carbon technologies and products.

“The importance of this research was underscored during the EU review. Funding agencies are now asking for human behaviour to be included in models”

This is because policymakers can explore a wider range of what-if questions with such models. Beyond typical financial policy instruments such as a carbon tax, they can now test the implications of informative policies, such as campaigns reinforcing social norms or targeting self-identity.

By systematically integrating behavioural dynamics into FRIDA and FeliX, WorldTrans is helping to redefine what the next generation of climate models should look like.

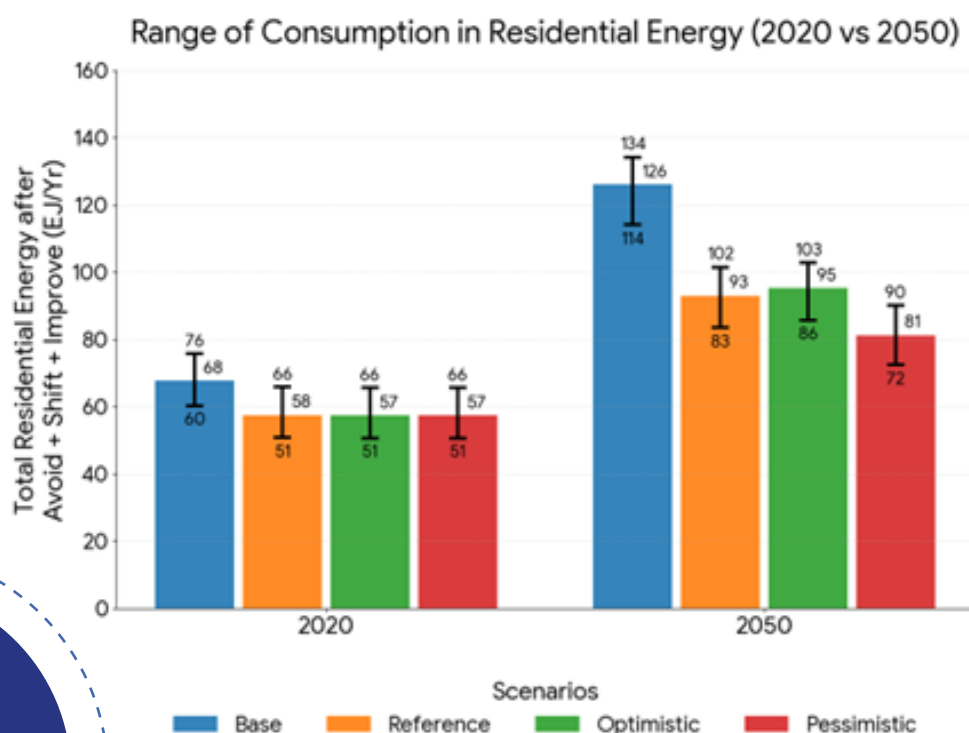


*Figure:
Residential energy
demand projections
driven by lifestyle
changes in different
scenarios.*

The Cascading Effects of Climate Change

Our recent findings demonstrate that incorporating the cascading effects of climate change into socioeconomic projections significantly alters our understanding of future development trajectories.

Using the FRIDA simulation model, we analyzed scenarios that include all climate impacts (the All-Impacts case) and found that economic growth is considerably lower compared to projections that exclude these dynamics (the No-Impacts case).

These results underscore the critical need to account for the interconnected nature of climate impacts in policy and planning frameworks.

One of the key insights from our work is the identification of cascading pathways that amplify vulnerabilities across sectors. For example, climate-induced loan defaults emerged as a dominant driver of economic disruption, triggering downstream effects such as reduced investment, constrained innovation, and weakened economic output.

Sectors like agriculture and industry are particularly affected, where declining labor productivity compounds these challenges. Additionally, rising costs for repairing climate damaged infrastructure and reduced credit availability create further barriers to economic recovery and growth.

Temperature increases also result in amplified material degradation, such as accelerated concrete corrosion, leading to higher maintenance costs over time.

Demographic effects further compound economic challenges, as slower population growth—driven by higher climate-related mortality—disrupts the balance between labor supply, consumer demand, and productivity.

Our analysis also highlights how climate-induced disruptions propagate through critical systems such as food and energy supply. Food demand declines due to reduced affordability (linked to falling real GDP per capita), while energy consumption is indirectly reduced through lower economic output, despite smaller direct effects from shifts in heating and cooling needs.

These cascading effects reduce affordability, resource allocation, and consumption patterns, ultimately lowering the projected warming.

In conclusion, our findings emphasize that ignoring the cascading and compounding effects of climate change, risks underestimating its socioeconomic consequences.

These results reinforce the importance of integrating systemic and interconnected climate impacts into both research and policymaking.

Paper in progress: Adakudlu et al.

"The role of climate impacts in Transition Pathways in an Integrated Assessment Model: feedbacks, cascades and interdependencies"

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