

DESTINATION EARTH

DESTINE PARTNERSHIP PLAN, USE CASES, AND UPCOMING OPPORTUNITIES

Jörn Hoffmann, ECMWF
(on behalf of the 3E partnership team)

1st DestinE User eXchange
ESA-ESRIN, Frascati, February 15, 2023



Funded by
the European Union

Destination Earth

implemented by



INTEGRATION AND CO-DESIGN

From cascaded Earth-system & impact-sector modelling...

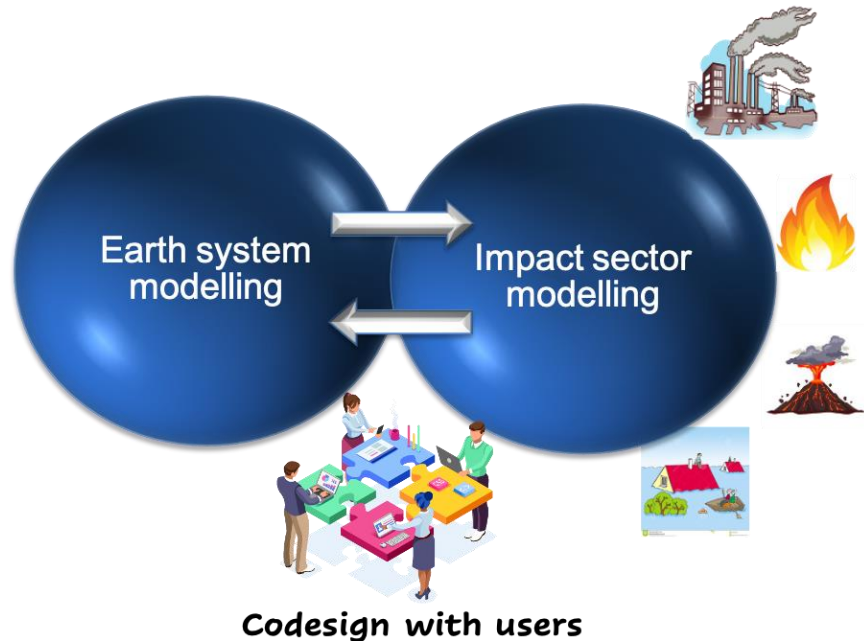


... to integrated Earth-system & impact-sector modelling...

Earth system
modelling



Impact sector
modelling



DIFFERENT USERS HAVE DIFFERENT EXPECTATIONS

Beneficiaries

Use tools that build on output of DT or downstream applications.

Bring input on needs and how to support decisions.

R&D Partner

Develop applications, analytics, models, monitoring systems to run in DestinE, in selected cases exploiting close coupling to DT.

Bring technical development, software tools, input to technical requirements definition.



Users

Use DestinE data and tools for further processing in own applications.

Bring own applications and tools to DESP, input on requirements and needs.

Technology contributor

Use DestinE technology framework and requirements.

Bring knowledge and infrastructure resources, new digital tools.

PILLARS OF STAKEHOLDER ENGAGEMENT

Principles:

- Co-design
- Co-development
- Co-evolution
- Openness

Open stakeholder dialogue

Objective

- Inform
- Engage / obtain buy-in
- Obtain feedback / new requirements / gaps
- Facilitate uptake

Who?

- Science & technology
- Operational stakeholders
- Public sector users
- Member States

How?

- Regular DestinE User eXchange workshops, surveys,
- Participation in events
- Communication
- Interaction with governance and advisory structures

Targeted User Partnerships

Objective

- Integrate 3rd-party models in DestinE
- Make DestinE relevant to impact-sector users
- Pilot impact-sector applications & services

Who?

- Selected r&d and operational partners
- User institutions: public sector, int'l institutions/conventions, private sector[#]

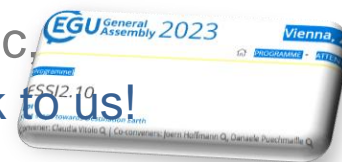
How?

- Partnership Agreements
- Contract development partners
- Procured use cases

OPEN STAKEHOLDER DIALOGUE



- The **DestinE User eXchange** (regular meetings – first one today!)
- Engaging DestinE web presence and active communication
- Participation in other events (not DestinE-specific, e.g. Copernicus, national meetings) – **Please talk to us!**
- Regular exchange with governance bodies and working groups
- Dedicated Technical Collaboration Groups on specific topics (HPC, Big Data, parallel DT developments)



Use cases

- Demonstrate DestinE features
- Feature improvement with DestinE
- Involve domain users
- Complementary to Copernicus & respect MS mandates



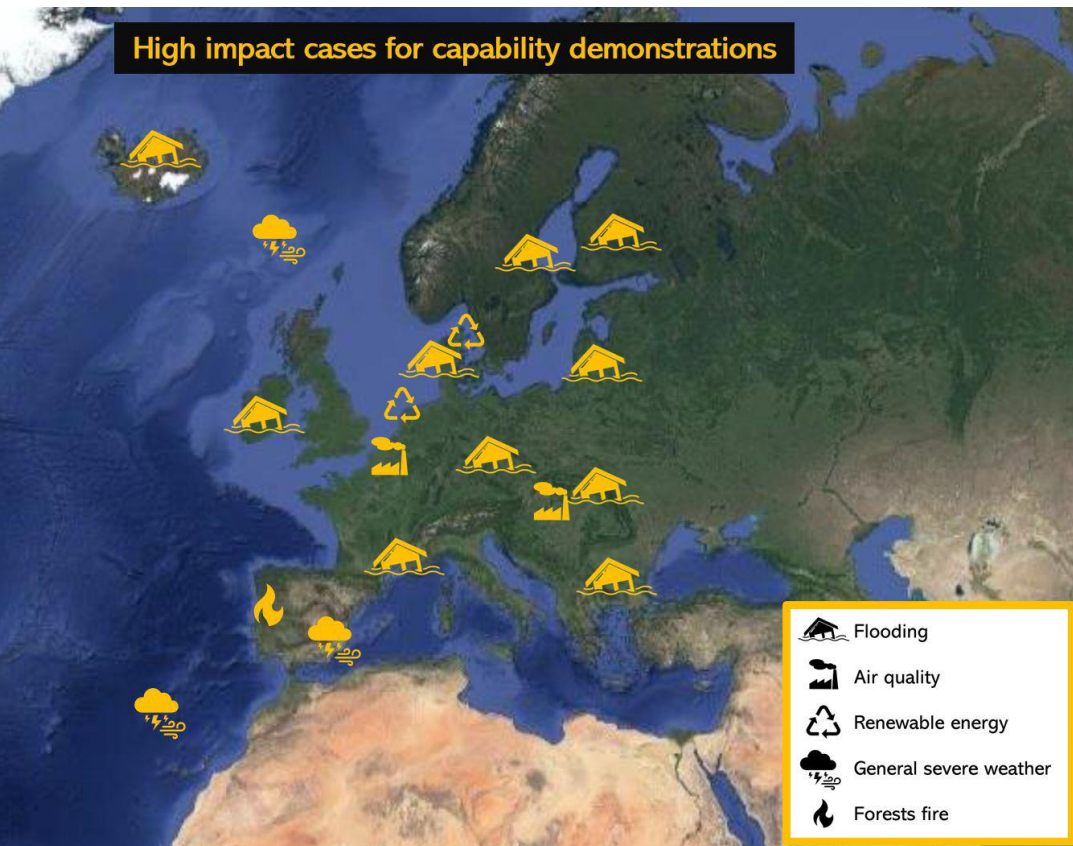
Contracts

1. DT Climate
2. DT Extremes
3. DestinE Use Cases
4. Adaptation modelling (planned)
5. DestinE Use cases – DESP Use Cases (2 rounds)



USE CASES IN DT EXTREMES (ON DEMAND)

High impact cases for capability demonstrations



Hydrology / Extreme Flood Events



Workflows for flood modelling in BG, CZ, DK, FI, FR, IE, IS, SE, SK



Air quality



Two air quality extremes:

- Cold inversion in Carpathian region, Jan 2017
- Ozone/heat in Benelux, Summer 2018



Renewable Energy



- North sea storms
- Ramping events (storms, fronts, ...)
- Solar energy



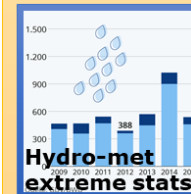
USE CASES IN DT CLIMATE



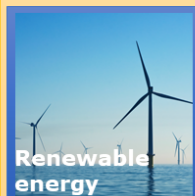
- Fire indices for Europe
- Fire spread models in Finland
- Burnt area, CO2 emissions (Finland)



- Future freshwater resources
- Future flood/drought
- Focus: Germany



- Extreme event statistics
- Event catalogue



- Wind resources globally (onshore, offshore)
- Wind turbine vulnerability under extremes and icing



- Spatio-temporal variability of heat waves
- Human thermal comfort indicators



FURTHER USE CASES (ECMWF)



- Resource adequacy
- Grid planning
- Validation



Renewables
Grid Initiative



- High-res regional AQ
- Coupled to DT Extremes
- Interactive immissions



- Five regional/local hydro models
- Disaster risk and climate scales



- Coupled urban climate model
- Simulate heat stress/health impact



- Wind damage risk predictions
- Harvesting conditions under climate scenarios



**Partly under
negotiation**

USE CASE TENDER (ESA)

Consortium: RHEA System, Trust-IT, Aristotle University of Thessaloniki

- Use cases selection (via Open Calls, Q1/2 and Q3/4 2023)
- Collection of requirements,
- DestinE Community building
- Website and Promotion



Objectives of Open Calls:

- Projects demonstrating innovative applications using DT data and DestinE tools/services for policy/decision makers and society at large.
- Demonstrate DESP capabilities, identify potential difficulties or limitations.
- Demonstrate the added value of the DestinE system for users and stakeholders
- Demonstrate the added value of EO data and existing technological solutions in combination with DestinE outputs.

1. Support for strategic technology agenda and roadmap for DestinE
2. Technology adoption to EuroHPC systems
3. Visualization



CINECA

expri^{ia}



Prepare for technology needs (short, medium, long)

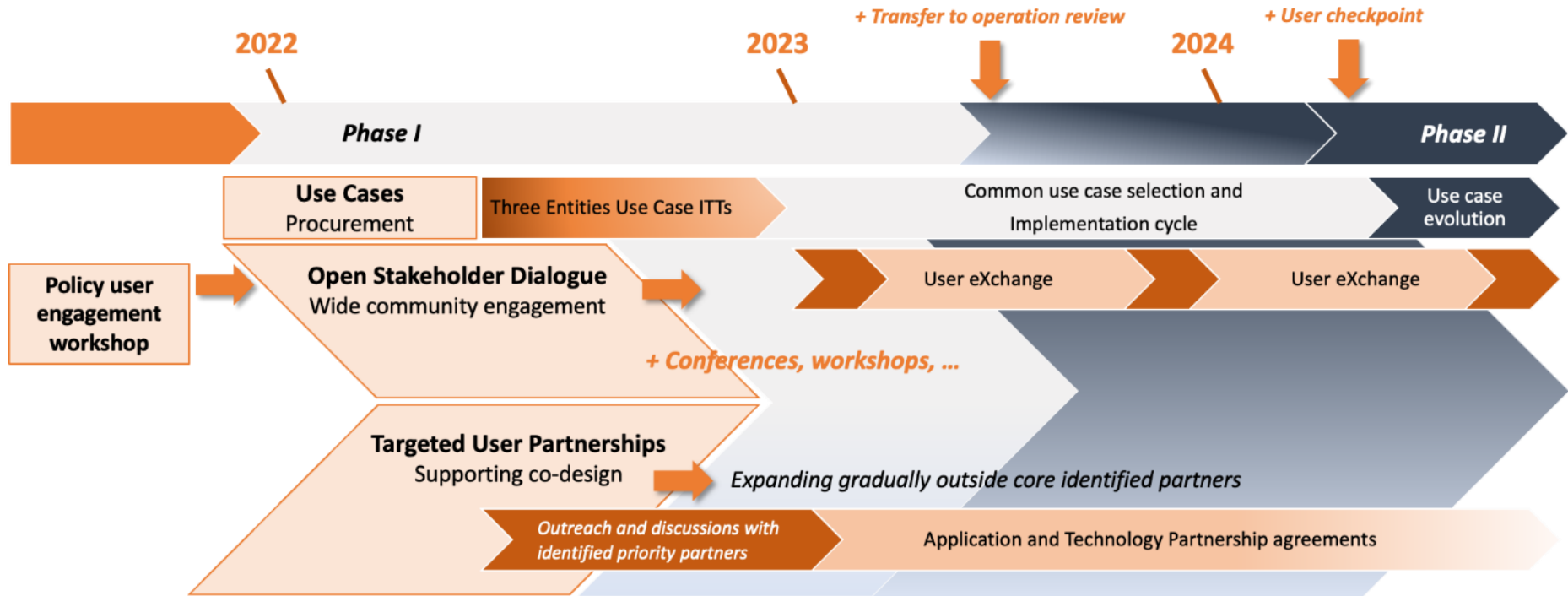
- Main HPC technology providers and integrators: HPE, ATOS, Intel, Nvidia, AMD, sipearl
- Cloud **technology** providers (focus on platforms): Stackhpc, EGI
- Additional partners from academia and research centres

How?

- Focus on what is not covered by tendered activities
- Regular exchanges at technical level
- No exchange of funds



PARTNERSHIP ROADMAP



CONTACT AND FURTHER INFORMATION

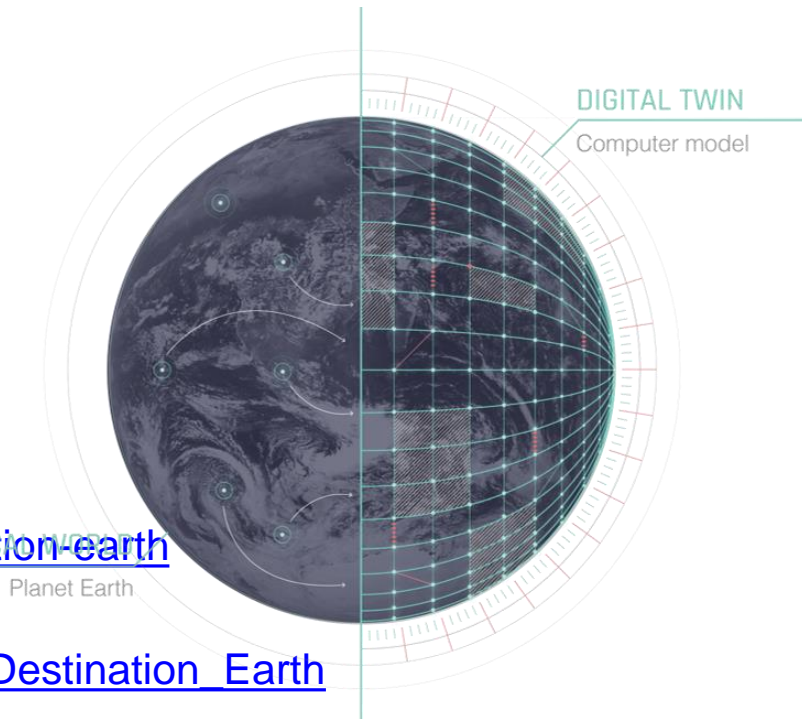
www.destination-earth.eu

<https://digital-strategy.ec.europa.eu/en/policies/destination-earth>

<https://stories.ecmwf.int/destination-earth>

https://www.esa.int/Applications/Observing_the_Earth/Destination_Earth

<https://www.eumetsat.int/who-we-work/destine>



Funded by
the European Union

Destination Earth

implemented by

