

Mapping the sensitivity of mitigation scenarios to societal choices pilot

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Entry in the community requirement database: [MESSAGEix-GLOBIOM \(EAP\)](#)

About the pilot

Description of supported work

Objective

Perform modeling studies to explore how future energy systems can evolve and to quantify the tradeoffs, co-benefits, and interlinkages between different aspects of the global energy systems in the context of international climate change policy and sustainable development.

General

This project aims to perform modeling studies to explore how future energy systems can evolve and to quantify the tradeoffs, co-benefits, and interlinkages between different aspects of the global energy systems in the context of international climate change policy and sustainable development.

Such analyses utilize so-called Integrated Assessment Models (IAMs), which are models of the energy, environment, and economic systems in order to quantify key variables of interest in these scenarios such as

emissions pathways consistent with international climate policy goals, tradeoffs of climate mitigation with land use and food security, among others.

This project will provide a proof-of-principle platform aimed at performing large scale (10-15k model runs) analyses.

Use Case

The IAM **MESSAGEix-GLOBIOM** (considered by the applicants at TRL9) will run sequentially on the selected resources where each job is independent from the other in a parametric fashion.

The Model will run in the resources (Virtual Machines) provided by EOSC resource providers.
The parametrized simulations, will be submitted by making use of a batch system manually deployed by the applicants.

An exploratory activity has been performed by applicants for running the full software stack in a containerized environment (using docker) on larger compute systems (e.g., HTC). Even if this activity is likely TRL5, it is envisioned as a key software infrastructure product to promote to TRL9 during this project. Starting from such assumption, a Mesos/Marathon cluster can be instantiated on the provided cloud resources and the parametrized simulations can run in it as independent containers.

The output carried out from the simulations will be stored in a distributed environment where can be accessed for post-processing analysis.

Team

Participant	Role	Name and Surname
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Technical Plan

Work planned for Q1	<ul style="list-style-type: none">• Infrastructure resource provisioning and settings• Enable federated identity management using one of the available AAI solutions provided by EOSC-hub.• Finalize and test containerized runs
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Work planned for Q2	<ul style="list-style-type: none"> • Feasibility study on the integration between the AAI solutions provided by EOSC-hub and the community specific AuthN/AuthZ mechanism • Set up the IAM platform and perform initial tests for model run.
Work planned for Q3	<ul style="list-style-type: none"> • Tune the platform services (Compute, Data Management) • Increase the scale of the tests of the platform in EOSC. • Analysis of results
Work planned for Q4	<ul style="list-style-type: none"> • Analysis of results • Registration of the IAM Platform in the EOSC Portal to be adopted by the community. • Investigate and verify the sustainability of the Platform for production purposes.

EOSC services and providers

Provider

- INFN-Bari

Services

- EOSC Federated Authentication mechanism
- EGI Cloud Compute service
- Storage service