

open ENTRANCE

Open ENERGY Transition ANALYSES for a low-Carbon Economy

Follow-up projects

02.06.2023



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 835896



In short, OpenENTRANCE has brought new opportunities

- iDesignRES
- Other Projects under evaluation
- OpenMod4Africa
- ECMF

iDesignRES



Integrated Design of the Components of the
Energy System to Plan the Uptake of Renewable
Energy Sources: An Open Source Toolbox

iDesignRES



About...

- ▶ **Funded by the European Commission**
 - ▶ Call: HORIZON-CL5-2022-D3-01 - Sustainable, secure and competitive energy supply
 - ▶ Topic: Energy system modelling, optimization and planning tools
 - ▶ Type of action: RIA
 - ▶ Grant nr. 101095849
 - ▶ Coordinator: Pedro Crespo del Granado (NTNU)
- ▶ Budget: 6,9 M€ (78MNOK), 662PM
- ▶ Duration: 48 months (start 1st September 2023).

iDesignRES consortium



NTNU
Norwegian University of
Science and Technology



E3 Modelling
Energy Economy Environment

SINTEF



Deusto
Universidad de Deusto

tecnalia



euroquality

TU WIEN
TECHNISCHE
UNIVERSITÄT
WIEN
Vienna University of Technology

PAUL SCHERRER INSTITUT
PSI

**ELECTRICITY
SYSTEM
OPERATOR**

LE2C
LOMBARDY ENERGY
CLEANTECH CLUSTER



**NORD
POOL**

ipto
INDEPENDENT POWER
TRANSMISSION
OPERATOR

aclima
Bosque Environment Cluster

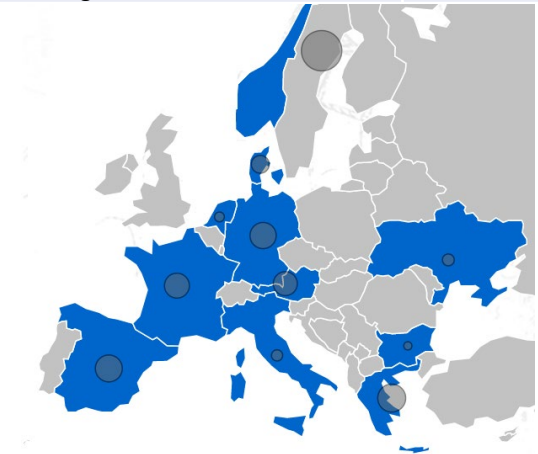
dixigroup
ANALYTICS
ON DUTY

**THE INSTITUTE
FOR ECONOMIC RESEARCH
AND POLICY CONSULTING**

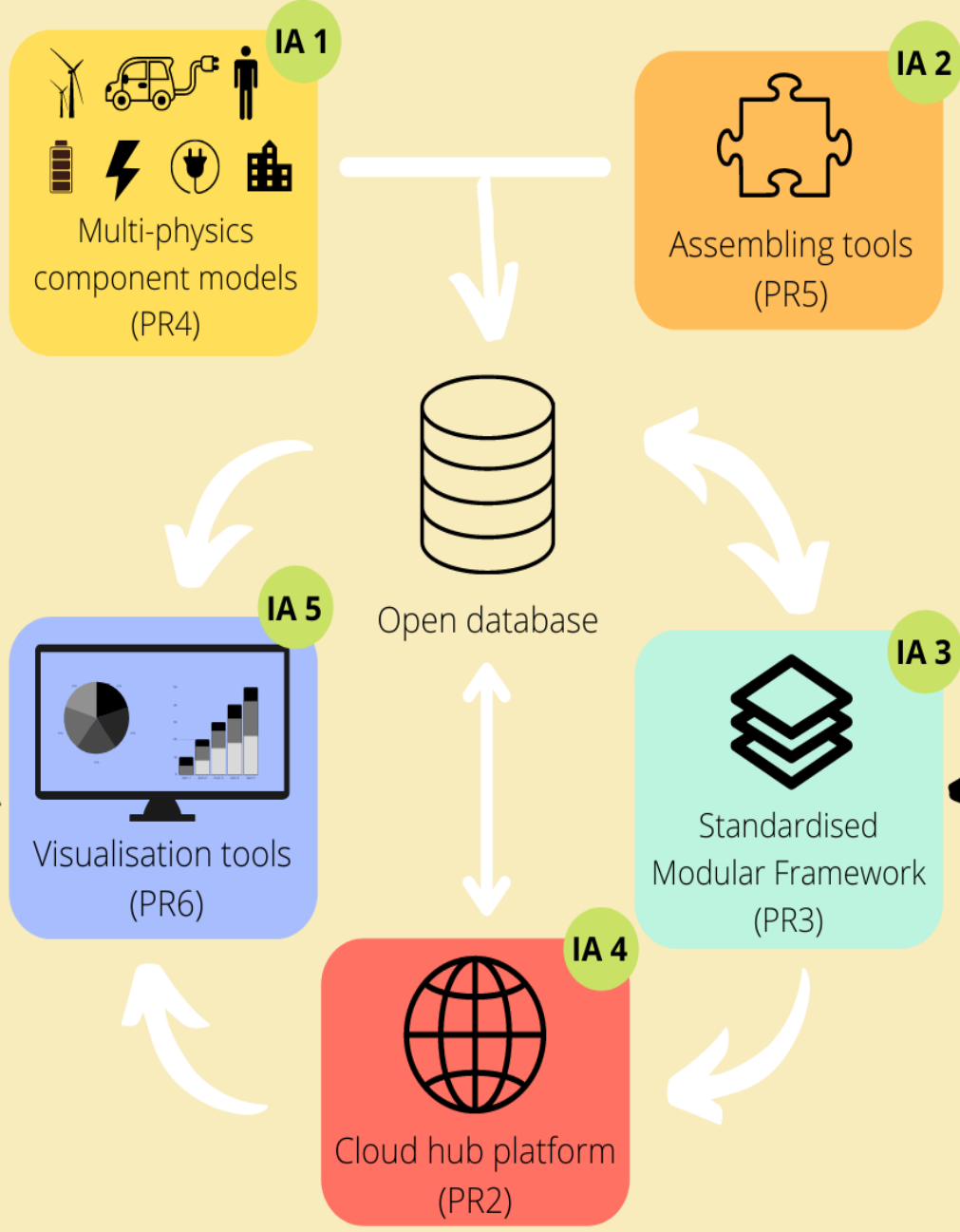
Netherlands Enterprise Agency

Fraunhofer
ISE

Participant organisation name	Acronym
Norges Teknisk-Naturvitenskapelige Universitet	NTNU
Technische Universität Berlin	TUB
E3-Modelling AE	E3M
SINTEF Energy Research	SINTEF
Internationales Institut fuer Angewandte Systemanalyse	IIASA
Electricité de France	EDF
Universidad de la Iglesia de Deusto Entidad Religiosa	UD
Fundación Tecnalia Research & Innovation	TEC
Aalborg Universitet	AAU
Euroquality SARL	EQY
Technische Universitaet Wien	TUW
Paul Scherrer Institut	PSI
Elektroenergien Sistemen Operator EAD	ESO
Lombardy Energy Cleantech Cluster	LE2C
Public Power Corporation S.A.	PPC
Nord Pool AS	NORD
Independent Power Transmission Operator SA	IPTO
Asociacion Cluster de Industrias de Medio Ambiente de Euskadi	ACLIMA
Dixi Group LLC	DIXI
Institute for Economic Research and Policy Consulting	IER
Ministerie van Economische Zaken en Klimaat	RVO
Fraunhofer Gesellschaft zur Foerderung der angewandten Forschung eV	ISE



O1-4: Technical developments of the project

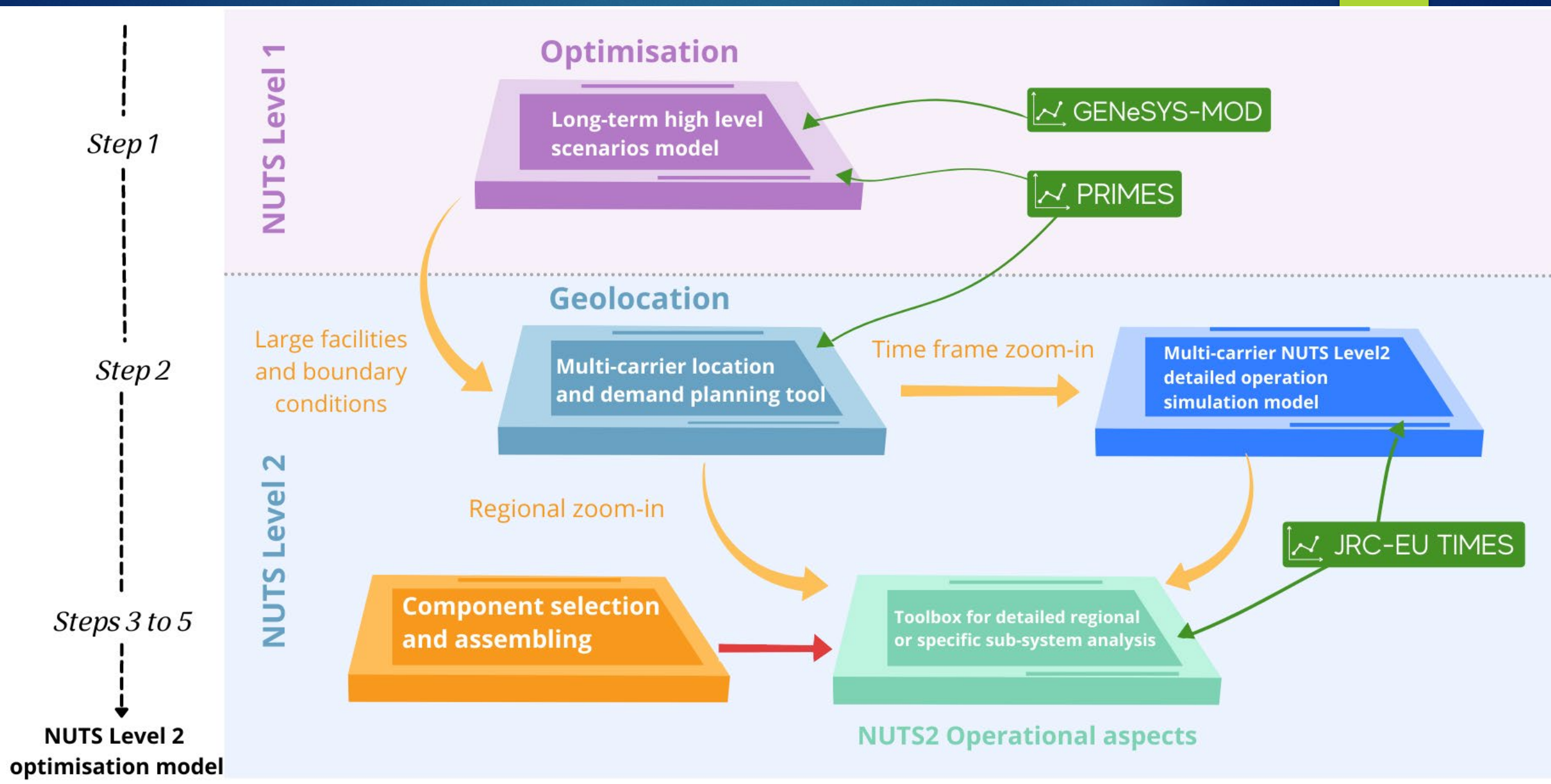


O5: Adaptability to all end-users

- Public authorities
- Network operators
- Industrials

O6: Real-life validation use cases

- Phase 1:
Macro-region: North Sea
Industrial cluster: Lombardy eco-region
- Phase 2 (replication):
Macro-region: South Eastern Europe
Indus. cluster: Greater Basque country, Net-Zero Industrial Supercluster
- Phase 3 (expansion outside EU):
Interconnection with Ukrainian grid



Industrial cluster use cases

Lombardy eco-region

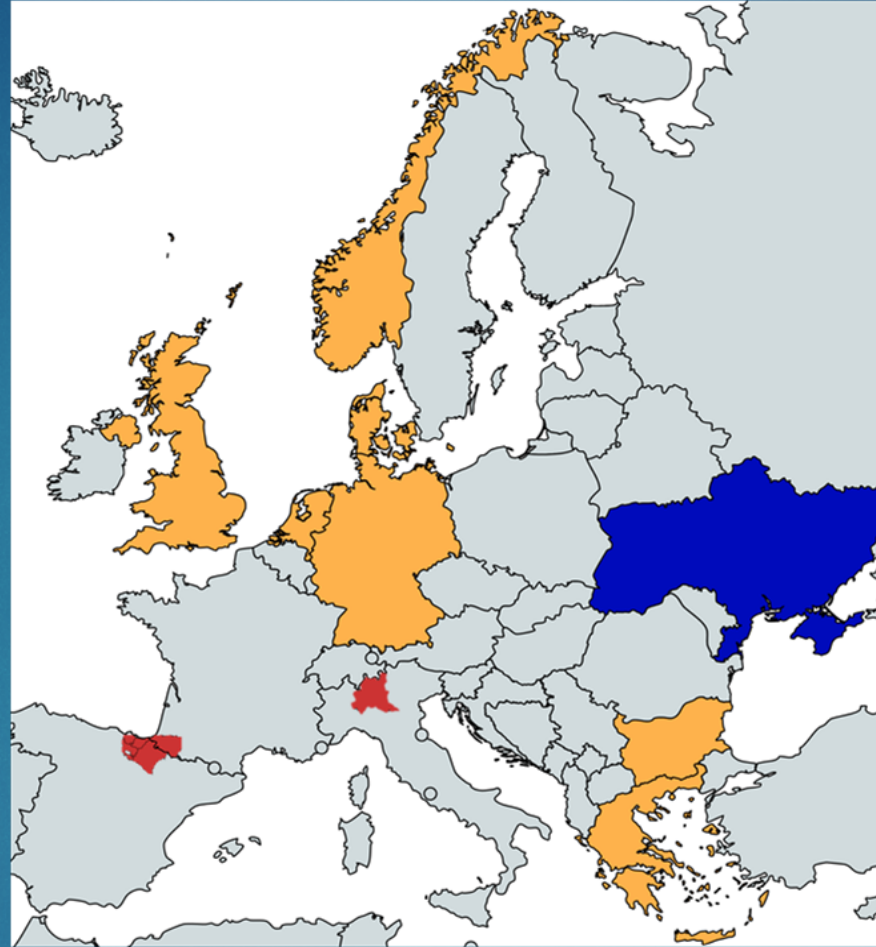


Local partners involved: **LE2C** (incl. public authorities and network op.)
Main focus on industrial symbiosis and self-consumption in industries

Greater Basque country Net Zero Supercluster (Replication)



Local partners involved: **UD, TEC, ACLIMA** (incl. public authorities and network op.)
Main focus on industrial symbiosis and circular economy in industries



Macro-region use cases



North Sea

Local partners involved: **RVO** (public authority), **NORDPOOL** (operator)
Main focus on regional symbiosis, wind and hydrogen capacities



South Eastern Europe (Replication)

Local partners involved: **PPC** (public and network operator), **IPTO** (Greek TSO), **ESO** (Bulgarian TSO)
Main focus on interconnections, islands decarbonation

Interconnection with non Central European grids



Local partners involved: **DIXI** (as policy adviser), **IER, UKRNG** (as TSO)

Main focus on electricity and gas interconnection with Ukrainian grid

Replicability of modelling, optimisation and planning processes outside of EU

iDesignRES use of openENTRANCE

- ▶ Common Platform:
 - ▶ Database: Scenario explorer
 - ▶ Nomenclature
 - ▶ Data processing tools
- ▶ Modelling tools extensions and data:
 - ▶ IAMs: **climate mitigation scenario data** MESSAGEix-GLOBIOM
 - ▶ GenesysMod
 - ▶ EMPIRE
 - ▶ Plan4RES
 - ▶ Other..

Other Projects under evaluation

- **CONNECT**

- COLLABORATION BETWEEN LATIN AMERICA & THE CARRIBEAN AND EUROPE ON RESEARCH INFRASTRUCTURES IN THE ENERGY AND BIODIVERSITY & CLIMATE CHANGE SECTORS

- **Man0EUvRE**

- Energy System Modelling for Transition to a net-Zero 2050 for EU via REPowerEU



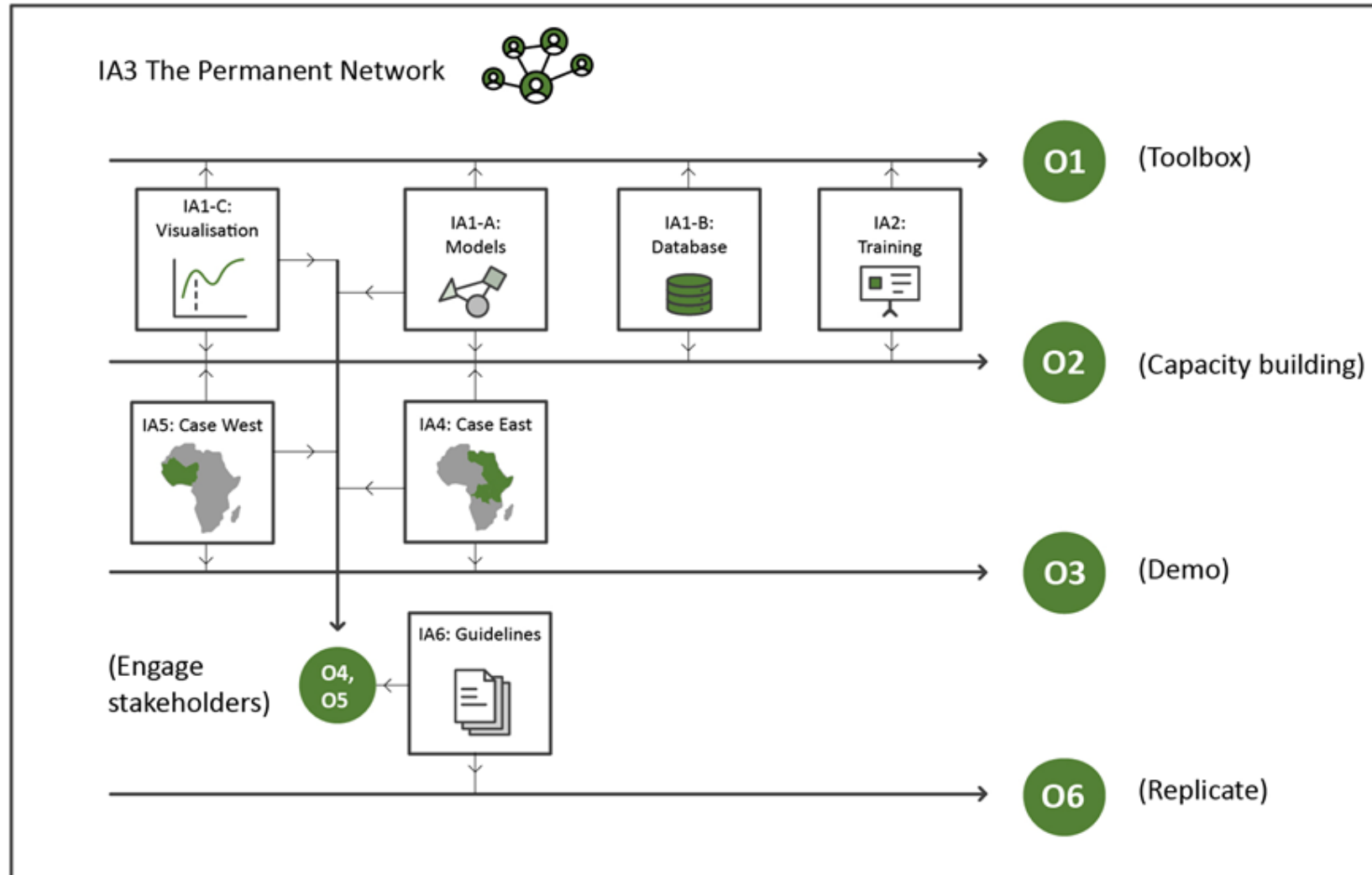
Also projects that use OpenENTRANCE results and beyond

Project	Type of project	Open ENTRANCE partner(s) involved	Reuse from Open ENTRANCE
Plan4res	H2020	EDF	Scenarios
SUPEERA	H2020	SINTEF	Scenarios and GENeSYS-MOD
EDF further use of The Open Platform	Internal EDF	EDF	Scenarios, GENeSYS-MOD, The Open Platform
TRANSFORMAR (GA no.101036683)	H2020	NTNU	Scenarios
NTRANS	FME a)	NTNU/SINTEF	Scenarios, linked tools: REMES, EMPIRE and GENeSYS-MOD
Nordic Energy Outlook	Nordic Energy Research	SINTEF	Scenarios and GENeSYS-MOD
Ocean Grid	Grønn Plattform NFR b)	SINTEF	Scenarios and GENeSYS-MOD
HydroConnect	KPS c) NFR	SINTEF/Fraunhofer	Data format and nomenclature
HydrogenPathways	NFR	SINTEF/NTNU	GENeSYS-MOD, REMES, EMPIRE, linked models
CleanExport	KPS NFR	SINTEF/NTNU	GENeSYS-MOD
Data Cellar	Horizon Europe	EDF	nomenclature, scenarios, other data from data platform (inputs and results of case studies)
InterPlay	FME proposal	SINTEF, NTNU, TU Berlin	GENeSYS-MOD; EMPIRE, scenario data

Project OpenMod4Africa: Objectives

- Develop an Open Energy System Modelling Toolbox tailored for African needs: the OM4A Toolbox
- Design and demonstrate capacity building and skills enhancing processes related to energy system modelling and the OM4A Toolbox for African experts
- Provide new insights into the possible pathways for the development of the African energy system
- Engage African decision-makers and planners to increase their knowledge on how to develop a sustainable, secure and competitive energy system in Africa
- Contribute to and cooperate with other ongoing initiatives (CCSE Partnership, LEAP-RE, AU-EU Water-Food Energy Nexus projects)
- Maximise replicability and exploitation of the project results

Project OpenMod4Africa: Concept



Project OpenMod4Africa: Using openENTRANCE products

- Common Platform (starting point to be further developed within OpenMod4Africa):
 - Database: Scenario explorer
 - Nomenclature
 - Data processing tools
- Modelling tools:
 - Energy system planning model: Genesys-Mod
 - Optimal dispatch and expansion
 - OpenTEPES
 - Plan4RES

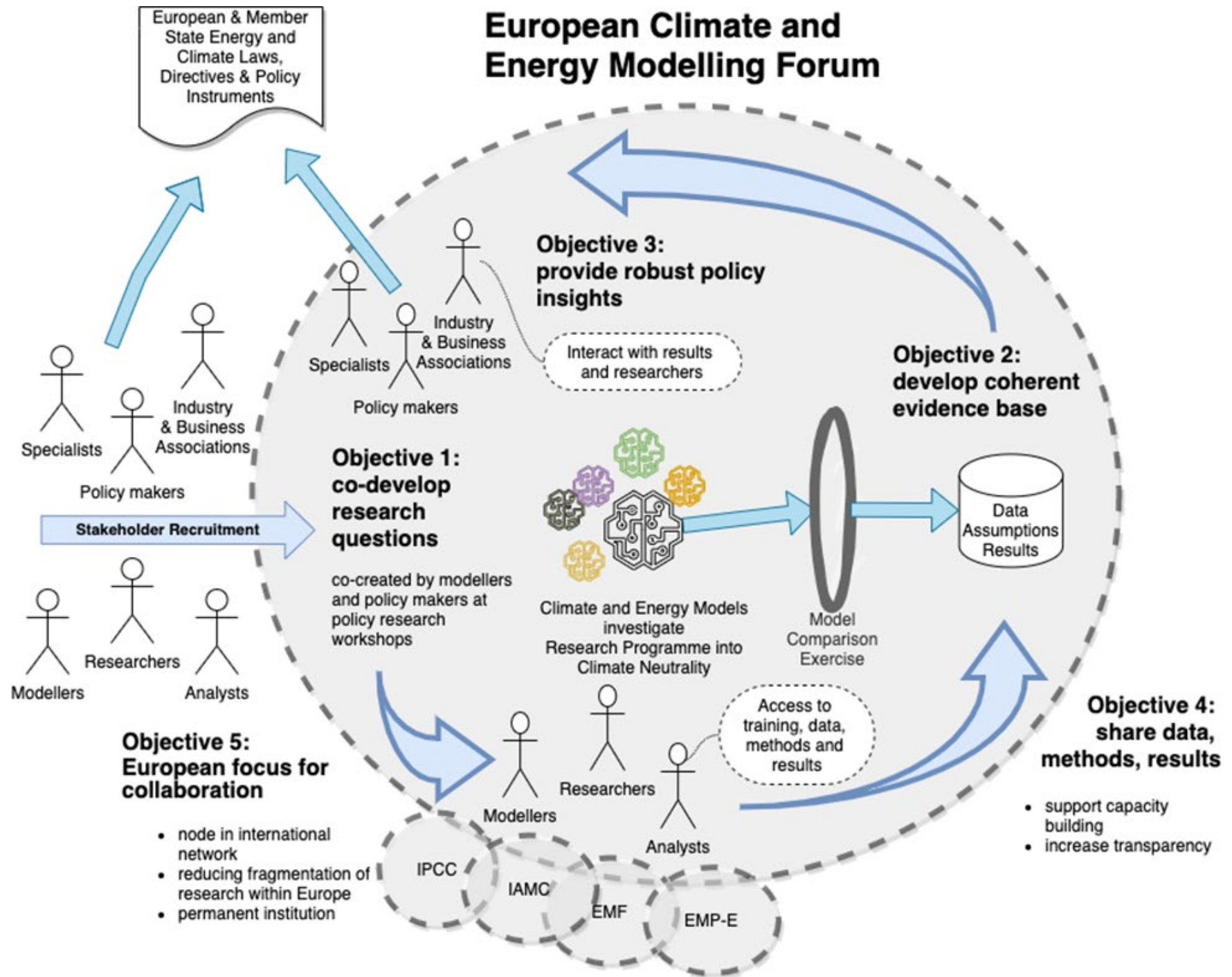
Project OpenMod4Africa: Geographical scope



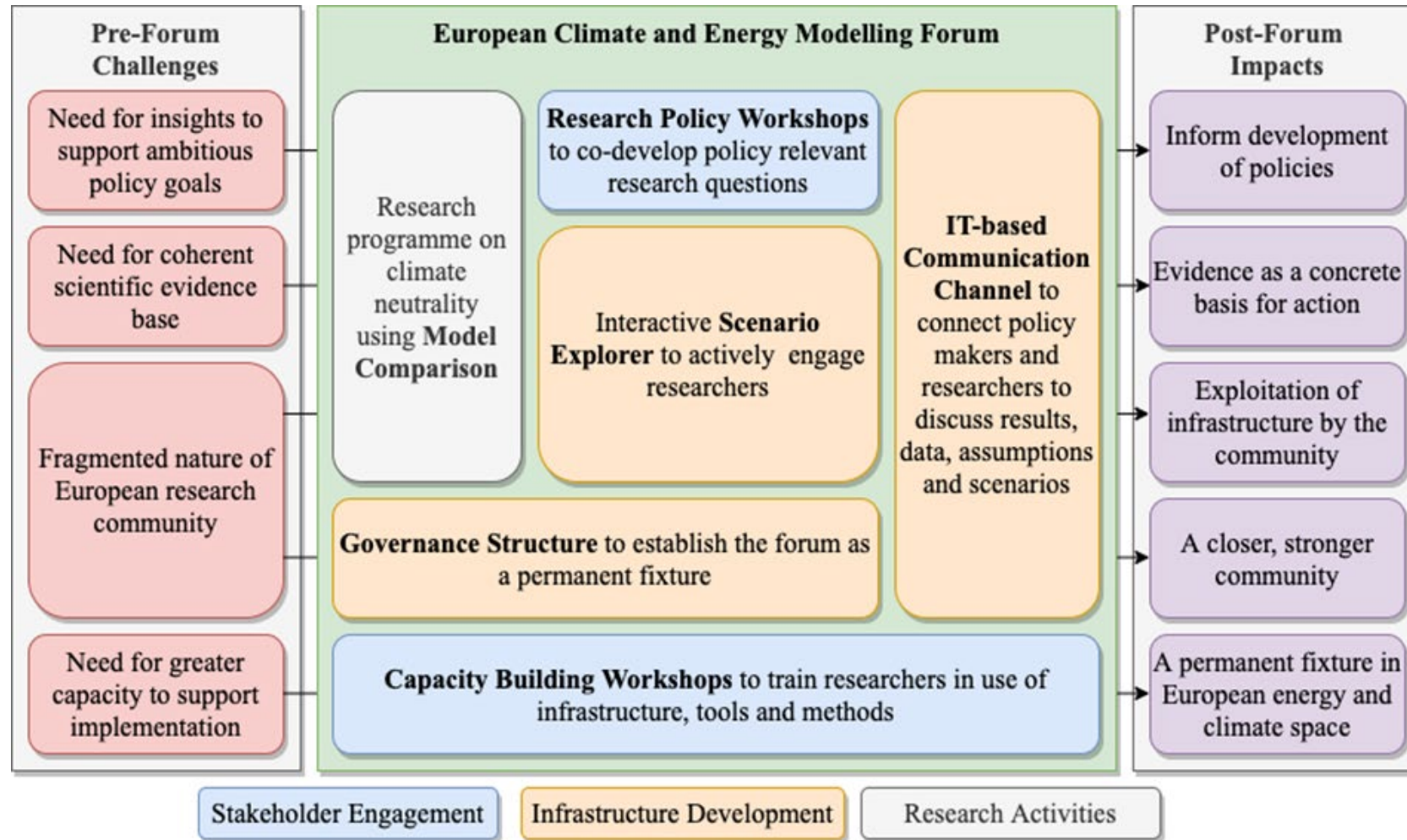
- 25 out of 55 countries in Africa are involved in the project
 - Through the EAPP and WAPP, in charge of the deployment and management of power markets in the eastern and western regions in Africa
 - Dealing with national utilities and authorities, as well other regional bodies like the regulators, if existing (ERERA)

Project ECEMF: concept

European Climate and Energy Modelling Forum



Project ECEMF: Methodology



Project ECEMF: using openENTRANCE products

- Common Platform:
 - Database: Scenario explorer
 - Nomenclature
 - Data processing tools
- Modelling tools:
 - IAMs: MESSAGEix-GLOBIOM
 - Optimal dispatch and expansion:
 - OpenTEPES
 - Plan4RES



Thanks!
Gracias!

