TradeRES: New Markets Design & Models for ~100% Renewable Power Systems

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Objectives

TradeRES ground-breaking goals are as follows:

1. To develop **new electricity market designs for ~100% renewable power systems**;

2. To **model and simulate the new market** agents, procedures and mechanisms;

3. To develop **open-access tools for analyzing ~100% renewable** electricity markets;

4. To **engage key stakeholders** in the development, improvement and use of the new market simulation tools;

- **Identify actual barriers and deficiencies** of current pricing and energy market structures
- **Calculate cost, value, and price structure of electricity in a ~100% renewable** power system (for 2030 and beyond).
- **Conceive, design and model electricity markets** that deal with **novel flexibility products** and options of the system.
- **Develop optimization and agent-based models beyond the state-of-the-art**.
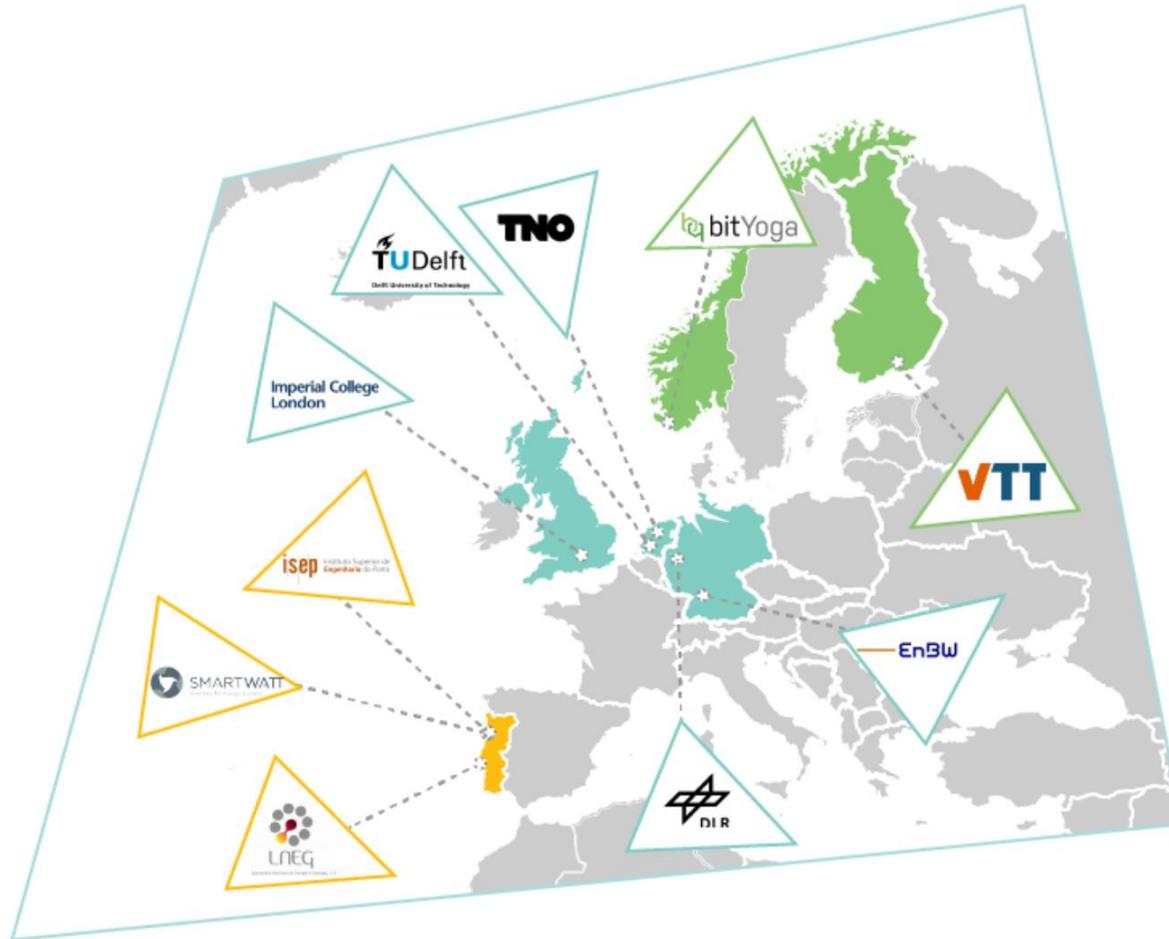
The consortium

Approach and Methodology

The approach has an iterative nature that consists of 5 steps:
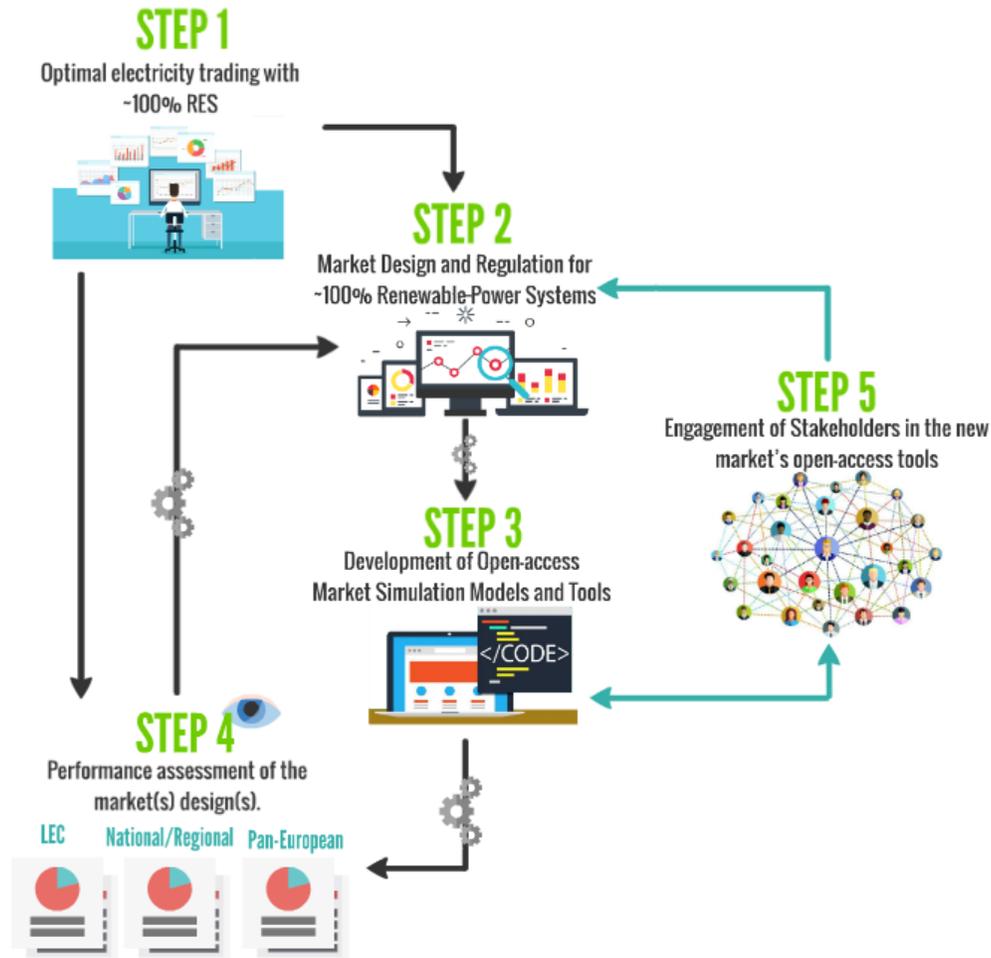
STEP 1 - Generation of a reference power system, scenarios and input market data (WP2)

STEP 2 - Market Design and Regulation for the ~100% Renewable Power Systems obtained in STEP 1 (WP3)

STEP 3 - Development of Open-access Market Simulation Models and Tools (to apply to markets designed in STEP 2 (WP4)

STEP 4 – TEST the designs (and the models) for different case studies (WP5)

STEP 5 – Engage (and collect reactions) from stakeholders (WP6)

(repeat until convergence!...)

From Local and National markets to a Pan-European wholesale Electricity market
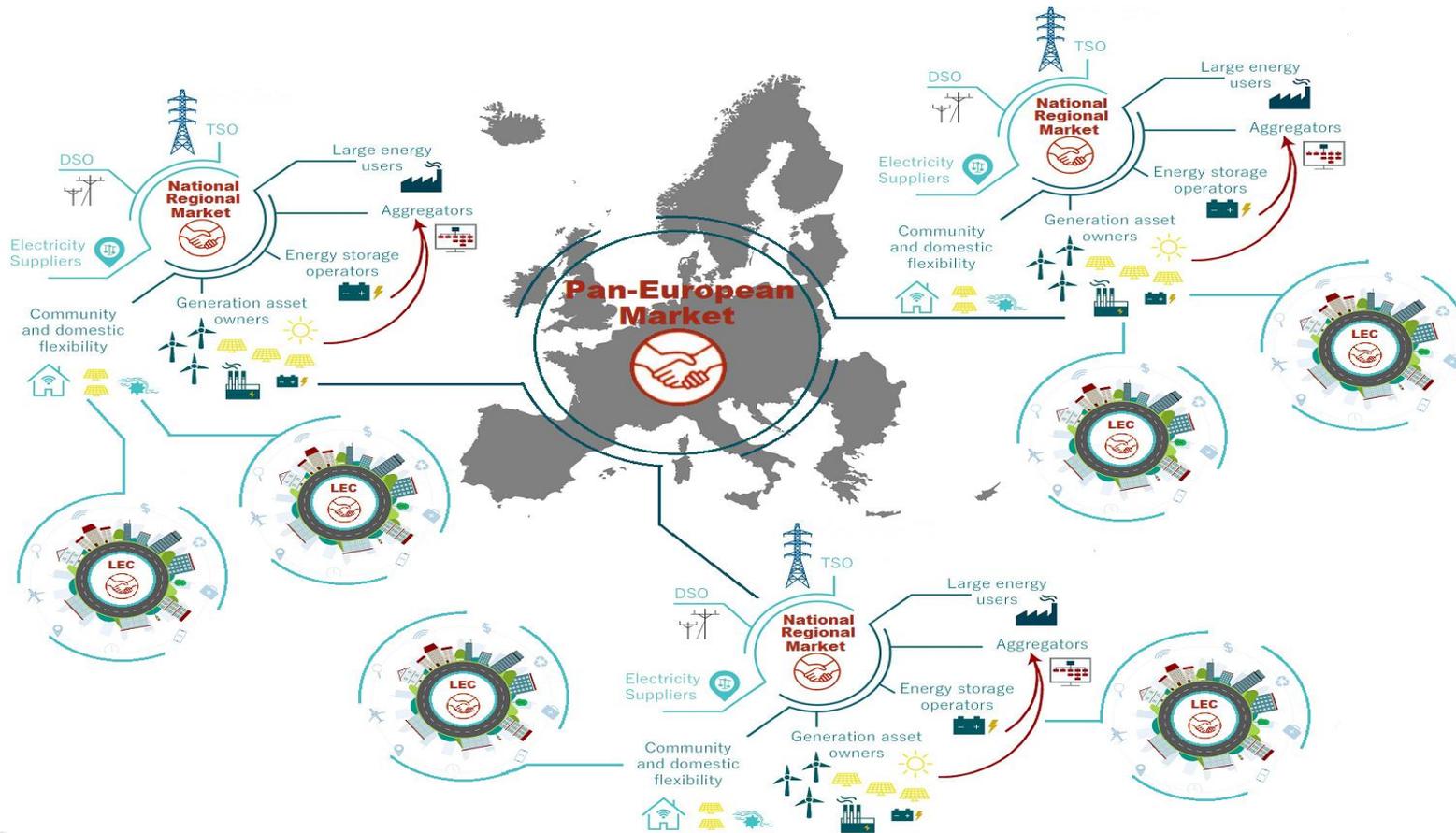
Task 5.2 – Local Energy Communities: Case Study A

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|---|
| Pan-European Scale |
| National/regional |
| Local Energy Communities |
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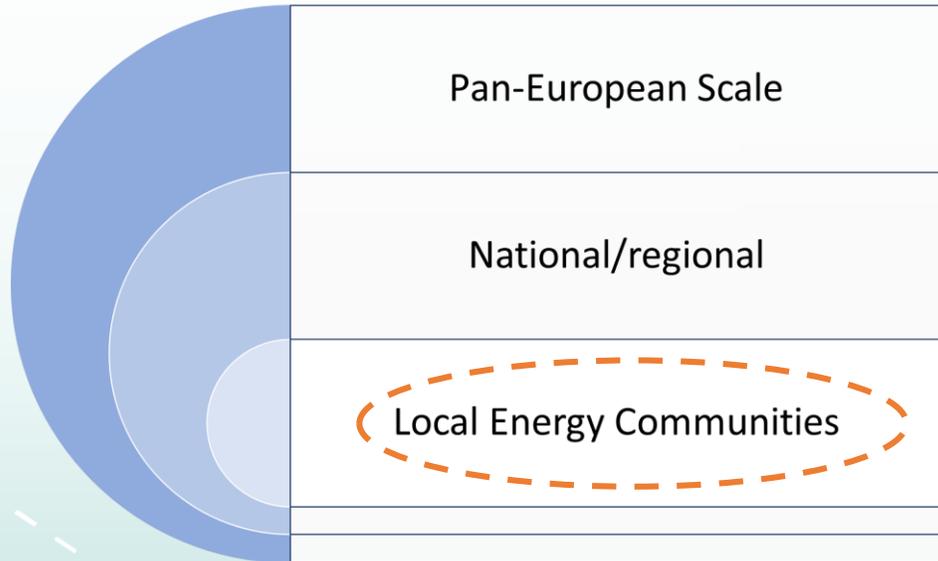
Task Leader: bYoga
Partners: DLR, ISEP, IMPC, LNEG, EnBW

- This task will provide an evaluation **of Peer-to-Peer** (p2p) community level markets and microgrid trading.

- Aims to **assess and predict the energy prosumption** of households, neighbourhoods, and **communities and its impacts on their electricity prices**.

- The **task will assess models for trading energy between peers and other local community members,** including EVs, prosumers, demand response, etc.

Task 5.3 – National & Regional markets: Case Studies B, C and D

| Pan-European Scale |
| National/regional |
| Local Energy Communities |
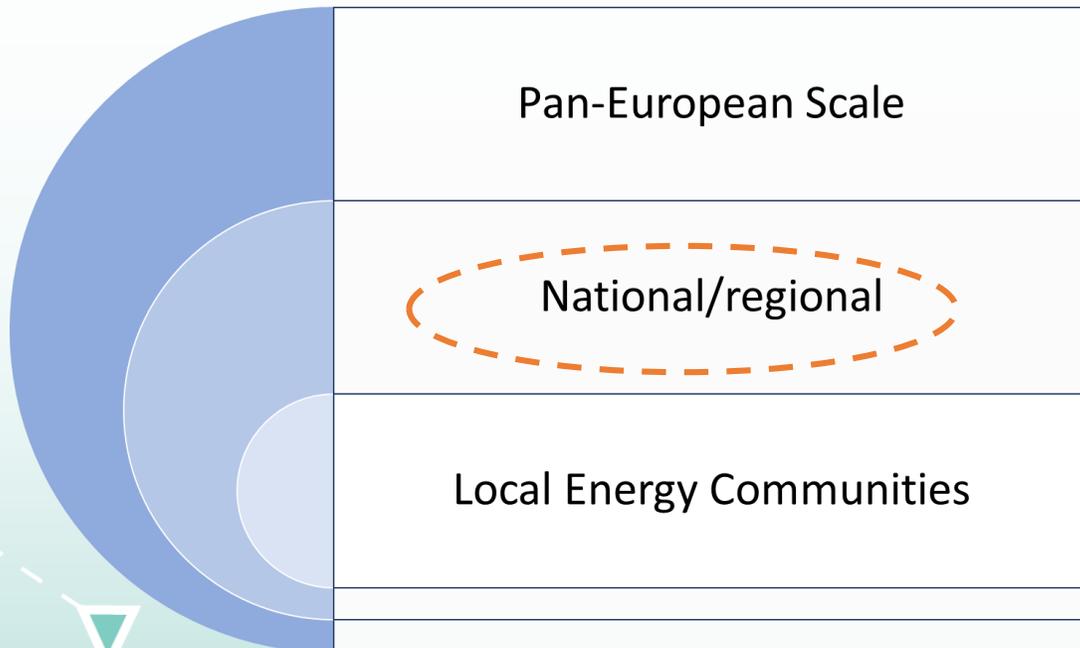
- **3 case studies (B-Netherlands, C-Germany,** and **D-Iberia)** will be considered and the performance of new market design elements will be assessed.

- The **results will be compared/validated** in two steps with:

  i) a **reference (optimal) energy mix/capacity**, and;

  ii) a **"baseline market scenario",** obtained with reference data applied to current market designs.

Task Leader: LNEG
Subtask Leaders: TNO (ST 5.3.1), DLR (ST 5.3.2), ISEP(ST 5.3.3)
Partners: TNO, IMPC, TUDelft, DLR, ISEP, SmartW, EnBW

Pan-European wholesale electricity: Case Study E
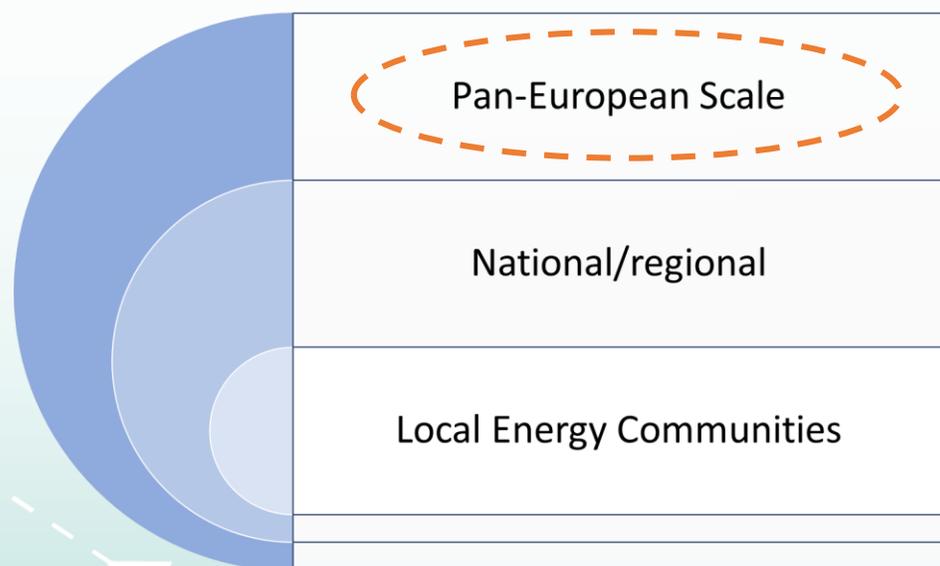
Task Leader: EnBW
Partners: bYoga, DLR, LNEG, TNO, ISEP

As foreseen in the European Clean Energy Plans.

- Very large scale requires some simplifications since:
  i) **intraday markets**, some countries use auctions and other continuous trading.
  ii) **European balancing markets** use several different methodologies for procuring energy.

- Assumes a **full harmonization of the European day-ahead markets** and the implicit allocation of the cross-border capacity.

TradeRES.

More information at https://traderes.eu/