

BLOCKCHAIN-SUPPORTED ENERGY TRADING INFRASTRUCTURE FOR E-MOBILITY

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Project "Open Mobility Electric Infrastructure (OMEI)"

- Creation of an open-access database for the planning and optimization of fast-charging infrastructures (see Figure 1)
- Integration of regional renewable energies and sustainable energy storage systems into the concept for charging infrastructures
- Development of a concept and framework conditions for the intelligent bidirectional use of electric vehicle storage systems

→ Database for MEI

Project extension: "Mobility Enhancing Infrastructure (MEI)"

- Pursues the goal of free, fair, robust and direct trading of decentral generated and individually consumed energy
- Energy trading with blockchain-based smart contracts

Scenario definition

Use of self-produced electricity from home at different location

- Prosumers gain Energy-Tokens for produced renewable energy at home and can use these somewhere else and at the same time (e.g. for charging e-car at work, see Figure 2)

Local energy market (with or without change of supplier)

- Local energy market with different producers nearby, who offer their renewable energy, from which the end customer can choose and sign a smart contract for a certain energy amount and price
- The (cheapest) supplier can be chosen for example every 15 min
- Based on the above-mentioned scenario, the customer also has the option of using the energy at a different location

Stakeholder survey

- Involvement of relevant stakeholders
 - Determination of needs and requirements regarding energy consumption, production and security
 - Gained insights were reviewed and summarized (see Diagrams)
- **95% of respondents would consider the possibility of using their self-generated electricity at another location**

Summary & outlook

- Results and simulation data will be open access and can be reused by interested parties from business and science
- Creation, adaption and testing of the blockchain-based trading platform based on feedback from the surveys
- The blockchain system will be tested in real conditions at both institutes

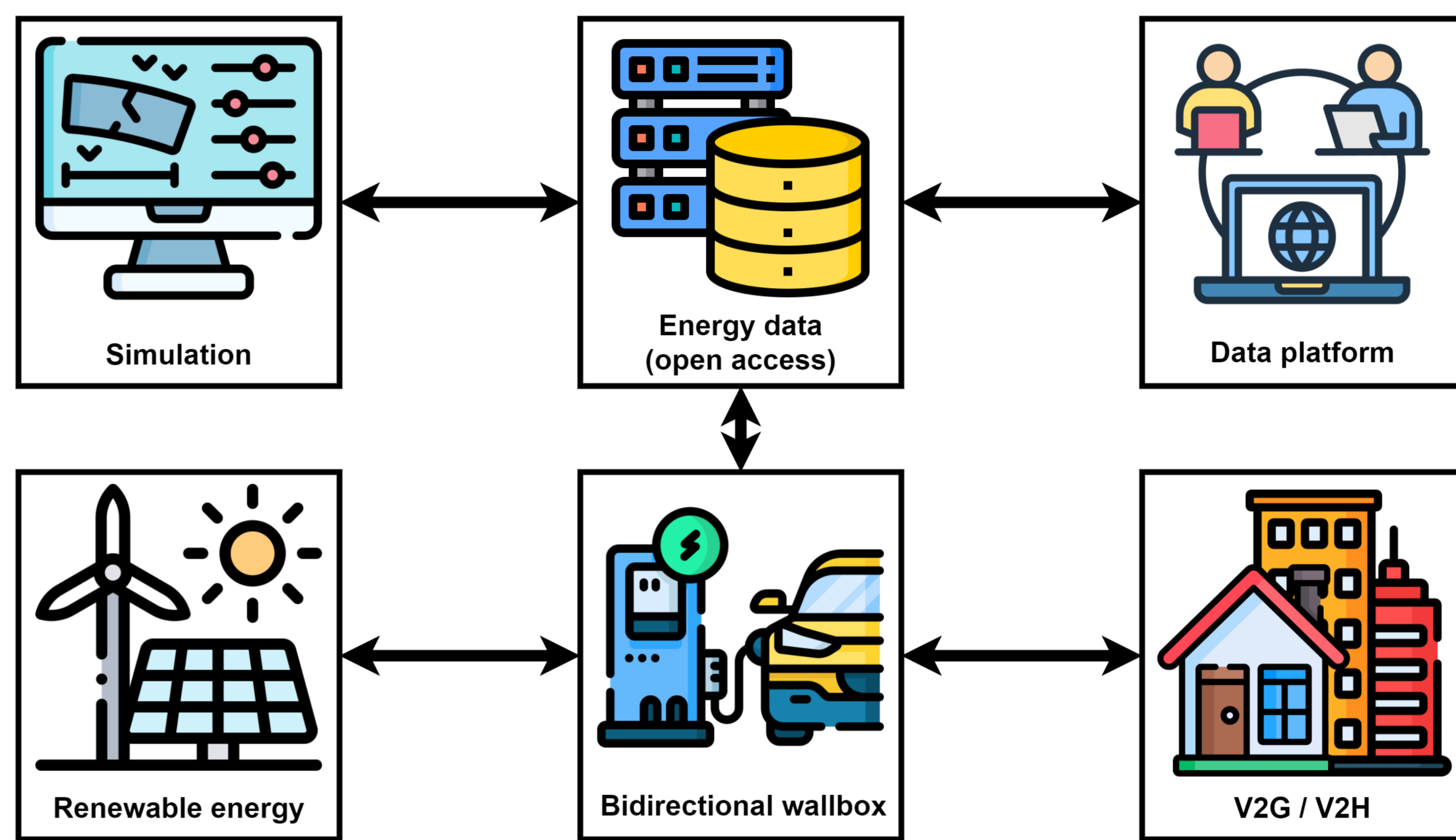


Figure 1: The concept behind OMEI

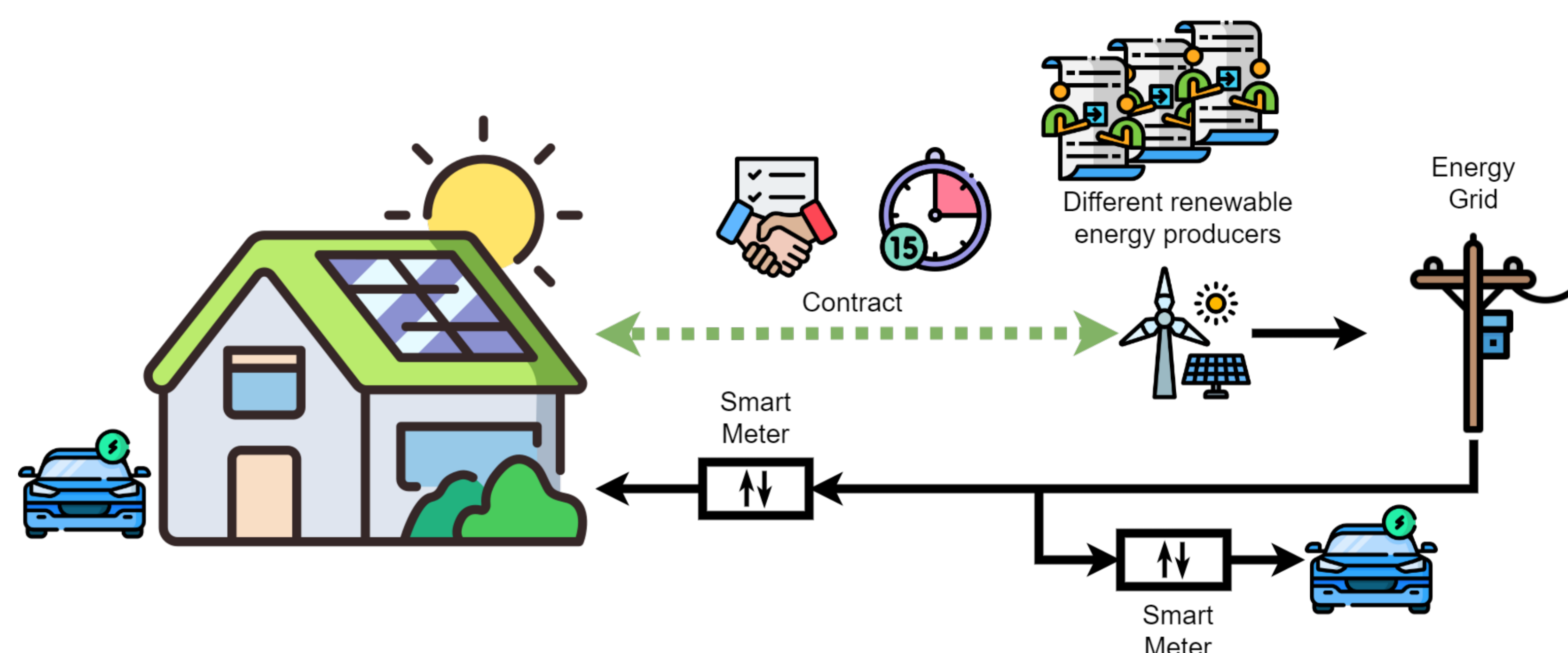
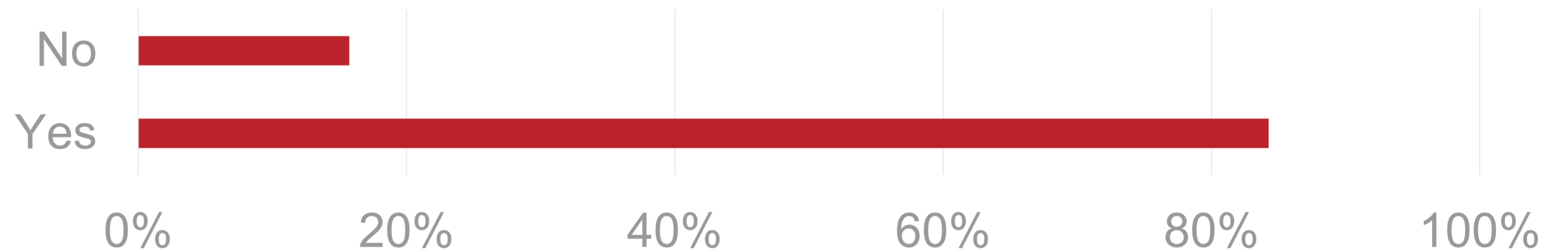
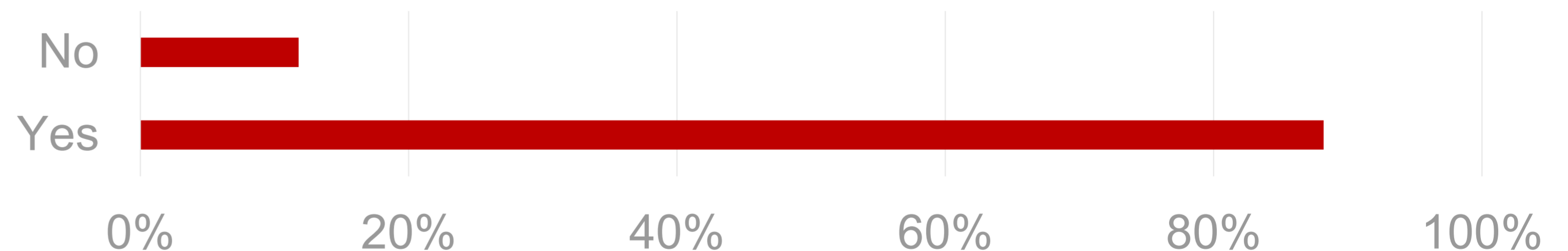


Figure 2: Scenario for a local energy market with possible change of supplier

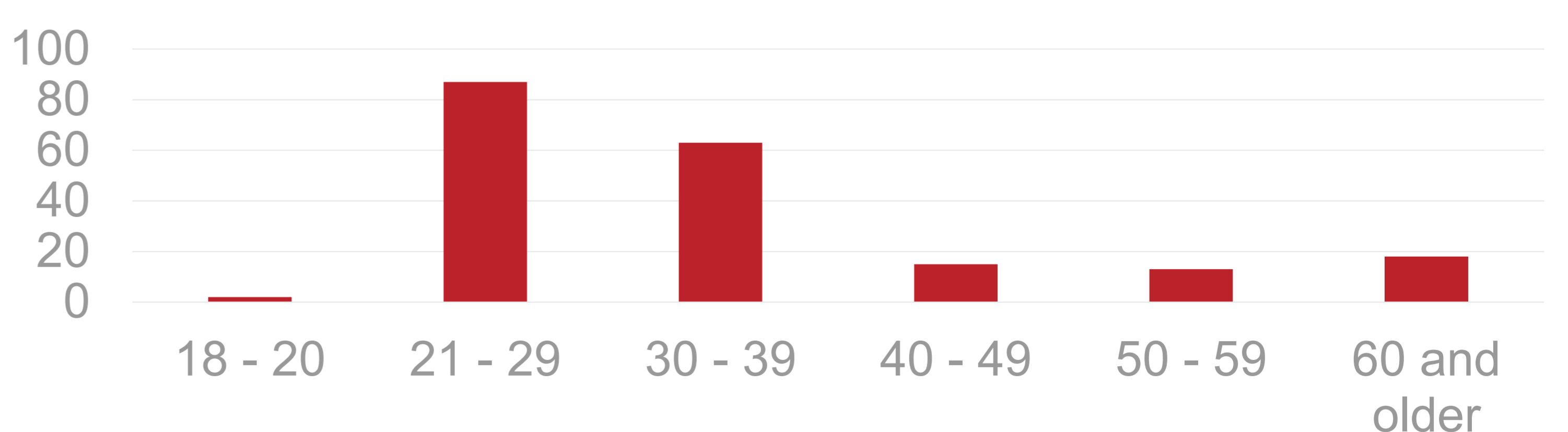
Could you imagine being a member of a local energy community where you could share energy with other homeowners and reduce costs together? (n = 197)



Would you be prepared to invest in renewable energies such as a PV system and/or electric car if you could reduce your energy costs and sell your surplus regionally via an online trading platform? (n = 195)



Distribution of the age structure of the survey participants (n = 197)



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