Bridging the Gap: An Interdisciplinary (Energy) Research Framework

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1. Introduction: Relevance and Objectives

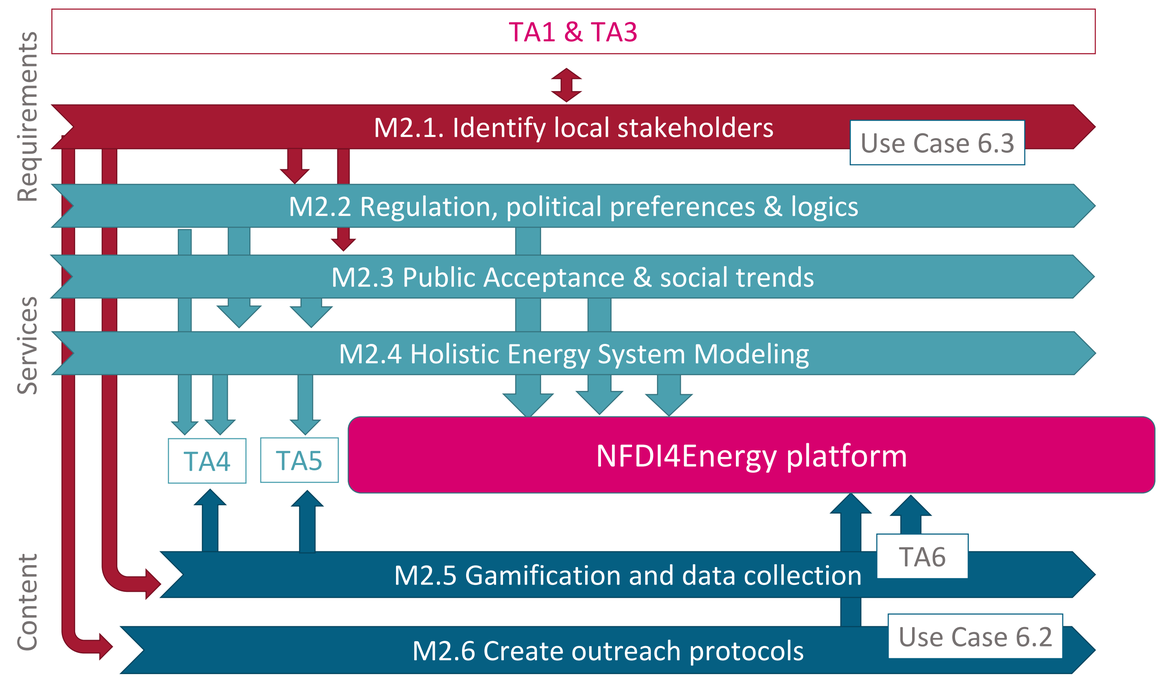
- **Importance of collaboration across disciplines** due to multifaceted nature of the ongoing energy transition

- **Fewer financial resources** for social sciences compared to natural sciences
- Challenging to **gain recognition** for interdisciplinary research
- **Uncertainties** regarding the content and methodological orientations of the project partners
- Questions about the **most effective level** of interdisciplinary cooperation

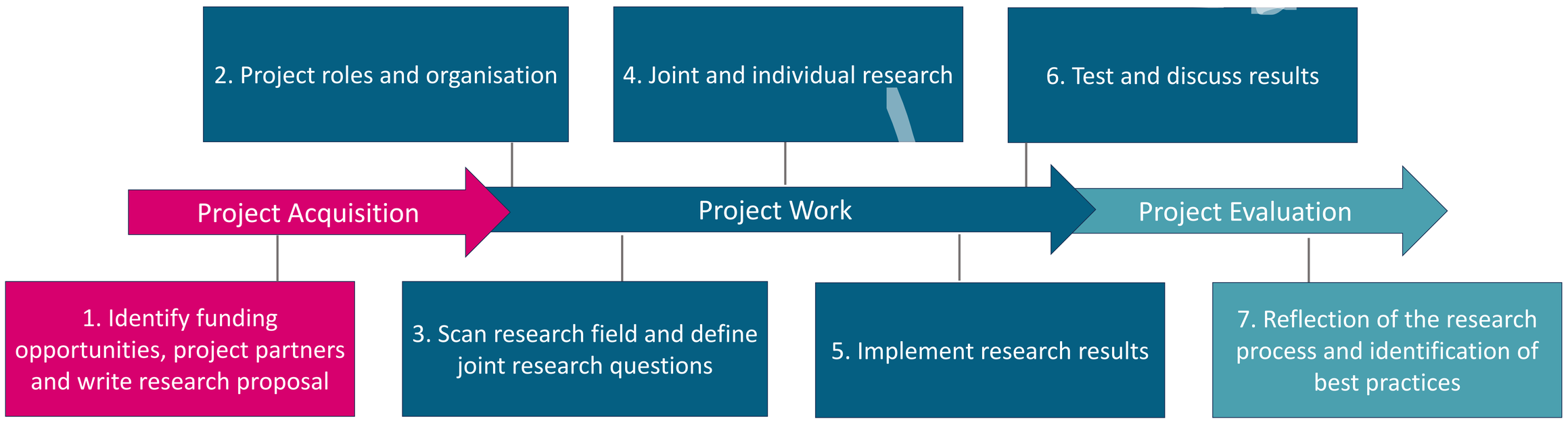
- Investigate these **interdisciplinary research challenges**
- Identify **best practices** and providing a **framework** for interdisciplinary (energy) research

- What **factors** need to be considered to foster **efficient interdisciplinary collaboration**?

Case: Task Area 2 of the nfdi4energy project



2. Method: Interdisciplinary (Energy) Research Framework



The research process is non-linear. Several feedback-loops take place from the steps of project evaluation to project work.

3. Application to the Case Study

Step 2 – *Project Roles and Organisation*

- Making agreements on data collection, shared vocabularies, and data storage (ensure interoperability and reusability of the data)
- Define project roles to implement those agreements based on strengths and weaknesses among the team

Step 3 – *Scan Research Field and Define Joint Research Questions*

- Identifying relevant data and literature
- Comprehensive review of existing climate and energy models that already incorporate social and political factors
- Formulate shared research questions and hypotheses; focusing on the dynamics and interactions among societal, political and economic factors

Step 4 – *Joint and Individual Research*

- Focal point of the project: empirical research and analysis
- 3-4 years: the research teams produce data for individual and joint research
- E.g., conducting qualitative focus groups in local case studies with citizens to explore their technological preferences and attitudes towards energy policies

Step 5 – *Implement Research Results*

- Developing qualitative scenarios that serve as a bridge for integrating our research findings into qualitative energy modelling

Step 6 – *Testing and Discussion of Results*

- To further enrich the dataset and critically test and discuss the results
- Application of gamification methods to test qualitative scenarios
- Using interactive online tools, to provide citizens with different inputs and choices within energy scenarios → assumptions can be revised where necessary

Step 7 – *Reflection of the Research Process*

- Obtaining practical research recommendations for cross-disciplinary projects and formulate modelling guidelines for the incorporation of non-technical factors
- Enhancing the practicality and relevance of our findings → contributing to the advancement of collaborative and nuanced interdisciplinary research practices
- Throughout the research process the team identifies lessons learned concerning interdisciplinary collaboration and the research results

4. Discussion and Conclusion

- With the **practical application of the framework** to the **nfdi4-energy project** the utility in addressing complex interdependencies between societal, political and economic factors in energy research could be demonstrated.
- **Crucial factors** for efficient **interdisciplinary collaboration**: common project language and shared research interests, iterative testing of the results and project evaluation
- **Contribution** to the informative value of energy system models by integrating non-technical drivers and constraints
- **Limitations** of the approach: funding disparities, recognition hurdles, and uncertainties in coordinating project partners
- **Next steps:** Test the framework further and provide detailed information and best practices

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