

PATHFNDR WP2: Pathways on local scale (city, village, district, site)

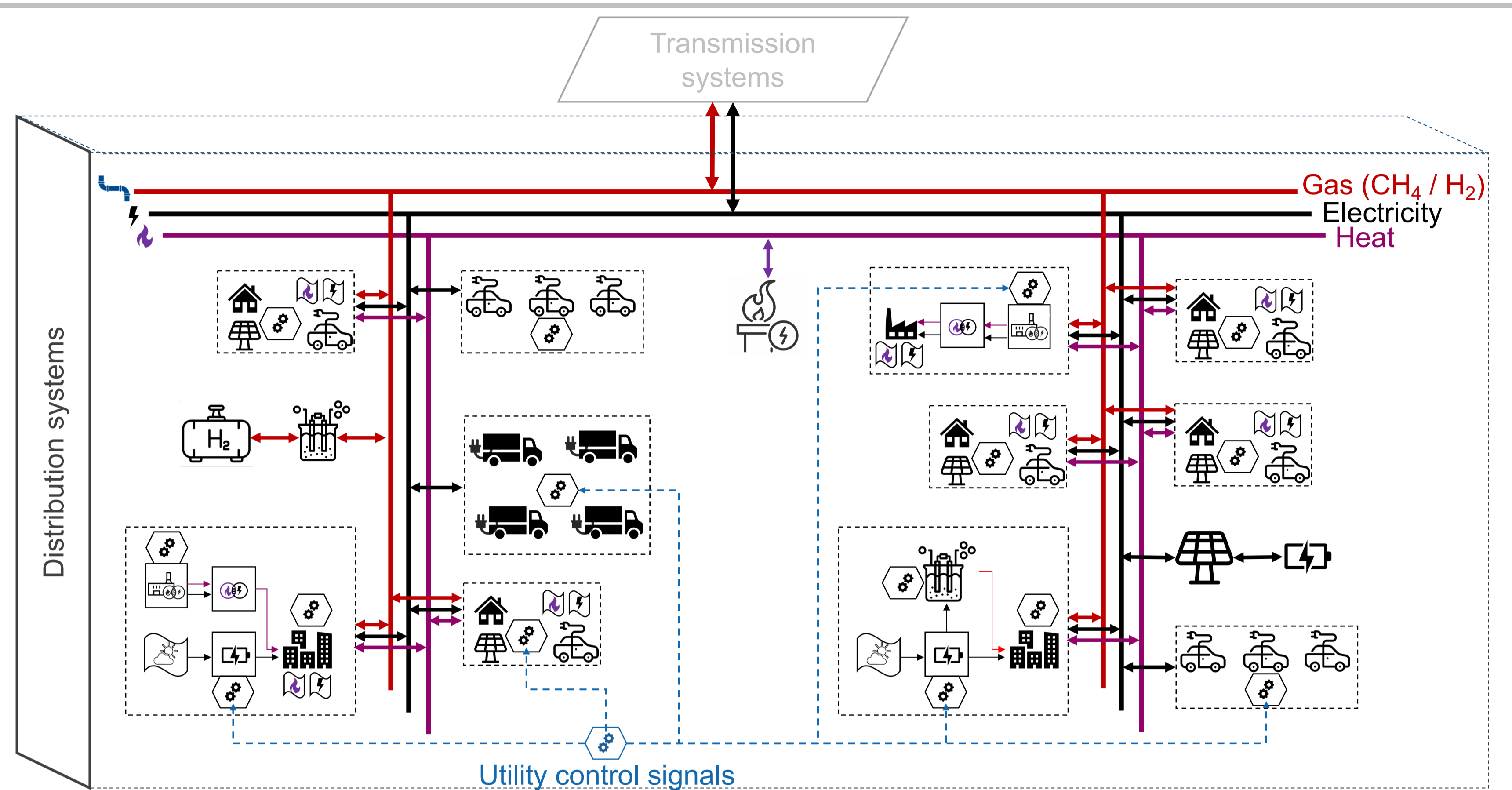
Work package overview and interactions with exogenous scenarios

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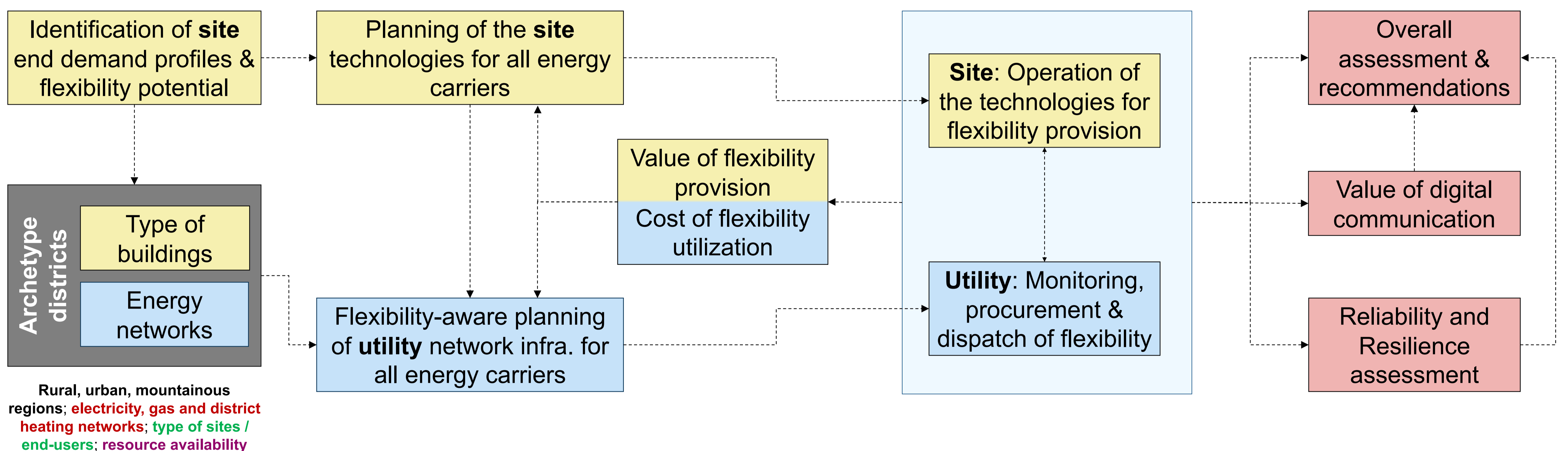
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OBJECTIVE / RESEARCH QUESTIONS

1. What are the flexibility needs of distribution utilities and why? What is the value of local **flexibility** for them?
2. How much **flexibility** can the various end-users provide?
3. Can utilities avoid / postpone infrastructure investments by utilizing **flexibility** provided by their customers?
4. How should distribution networks be operated such that distributed **flexibility** is used in a coordinated way?
5. Would **coupling** electrical, thermal and gas distribution systems in local multi-energy systems be beneficial?
6. If yes, how should utilities and municipalities plan and operate their energy systems in a **coupled** manner?

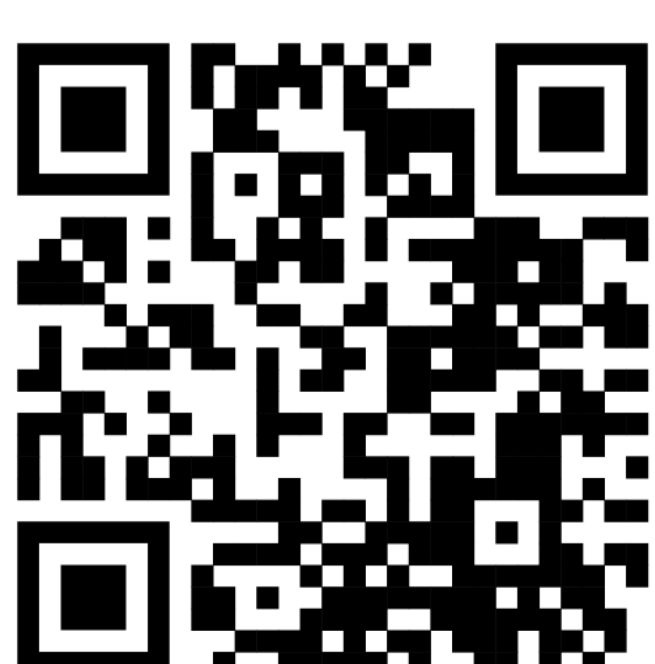


OVERVIEW OF THE FOLLOWED APPROACH



REQUIRED (OR SIMPLY USEFUL) SCENARIO INPUTS

1. **Prices** (hourly resolution) of the various energy carriers (electricity, gas, hydrogen, etc.) at the interface between transmission and distribution.
2. **Availability of energy carriers** at the interface between transmission and distribution.
3. **End-energy demand**, per demand sector (electricity, heat, mobility, etc.) at country, cantonal and municipality level.
4. **Penetration levels of various technologies** at end-customer level, such as electric vehicles, heat pumps, PVs, batteries, etc.
5. Current and anticipated future **cost of the various technologies** (investment, operation, maintenance).
6. **Policies and regulations** affecting the optimal economic choices (e.g., subsidies, taxes) and / or the KPIs (e.g., a utility being obliged to consider distributed flexibility options prior to grid expansion) of the stakeholders at distribution level.
7. **Market rules** defining the obligations and opportunities of the various stakeholders at distribution level.
8. [Transmission system flexibility needs (for balancing & ancillary services) and associated prices signals.]



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