Data-driven operation of building heating to support the energy transition at community level

Learnings from field applications

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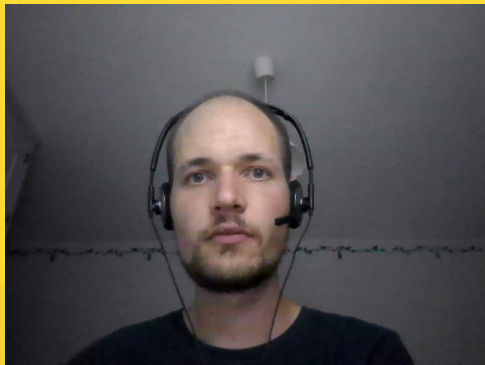
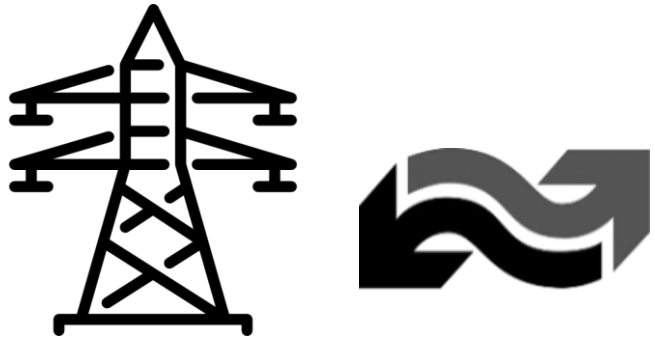


Many challenges at different levels

Reduce the global climate footprint



Integrate renewable sources

Improve planning and operation

Reduce losses

Ensure cost-efficient operation

Maintain buildings and systems in a healthy state

Secure comfort and quality of service

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Data-driven operation of building heating

There are 3 important dimensions on the demand side in a 'smart' energy system

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Quality of service: satisfy users' needs

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Efficiency: use only the amount of energy that is needed

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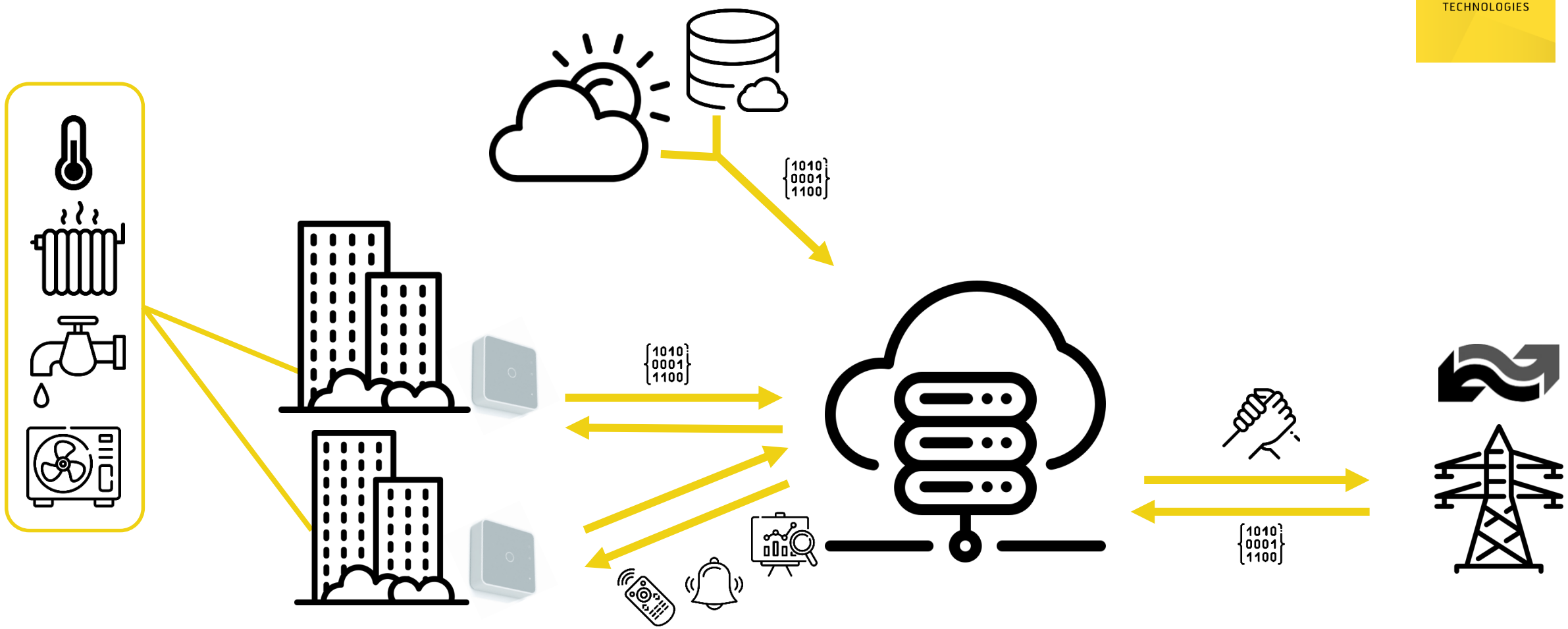
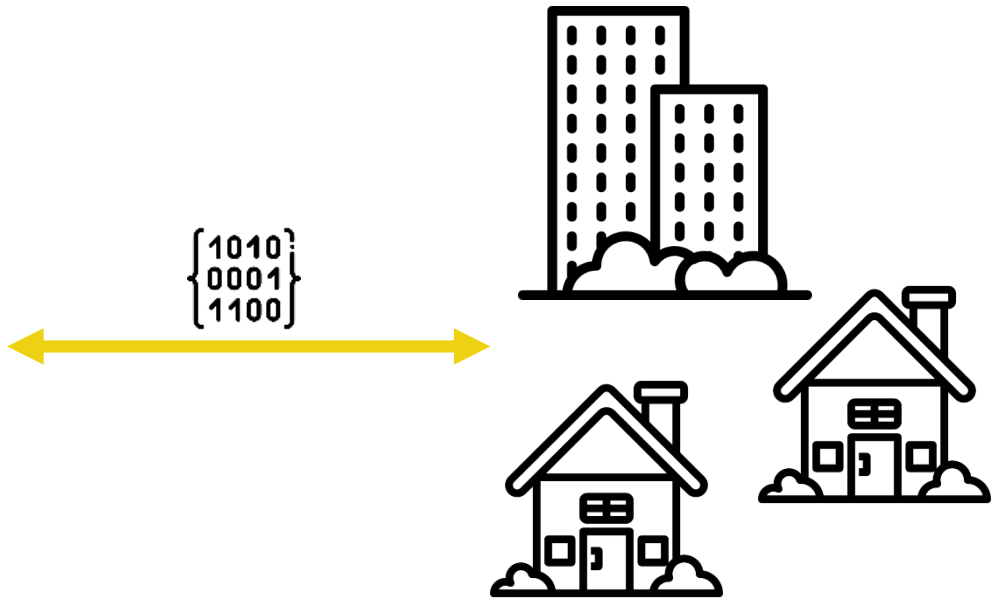
Flexibility: use the right amount of energy at the right time

Our cloud platform binds different actors and data sources



Energy management is facilitated by data-driven tools

- Advanced model-based alarms
- Model-based optimised control
- Integrated operation of building systems, also with local energy production
- Remote diagnostic and management
- Detailed analysis of performance



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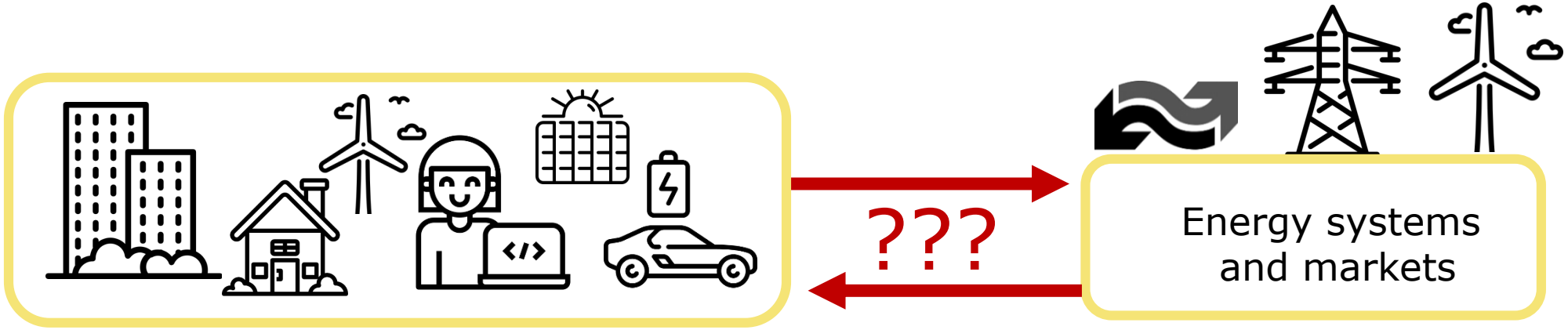
Data-driven control at community level

Finding local solutions with most effective contribution to the green transition

Energy systems and markets

Optimising for the 'right' thing is no trivial thing

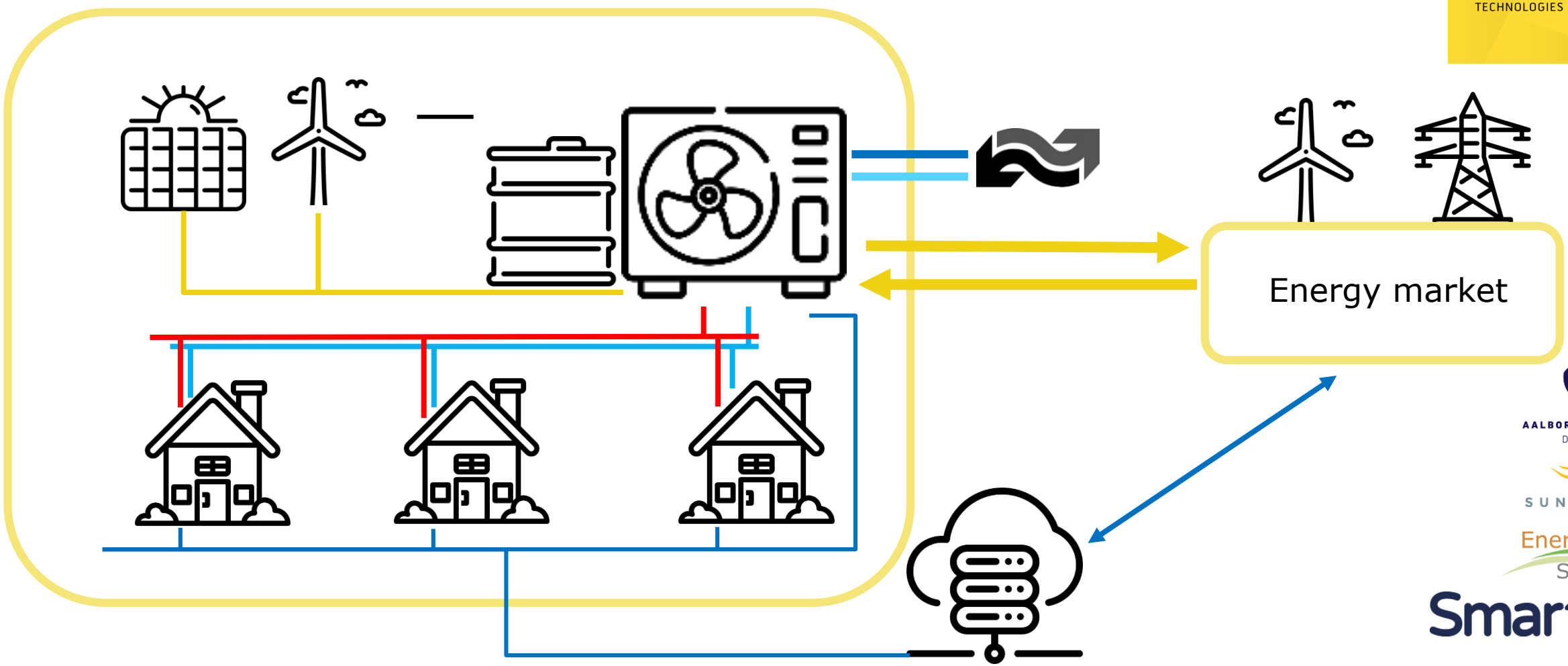


Should we operate energy assets to:

- Maximise self-consumption?
- Minimise imports?
- Minimise the net economic cost of importing energy?
- Minimise the carbon footprint of the energy used in the community?
- …

(Luckily, the cases often have mathematical similarities)

A heat-community with shared booster



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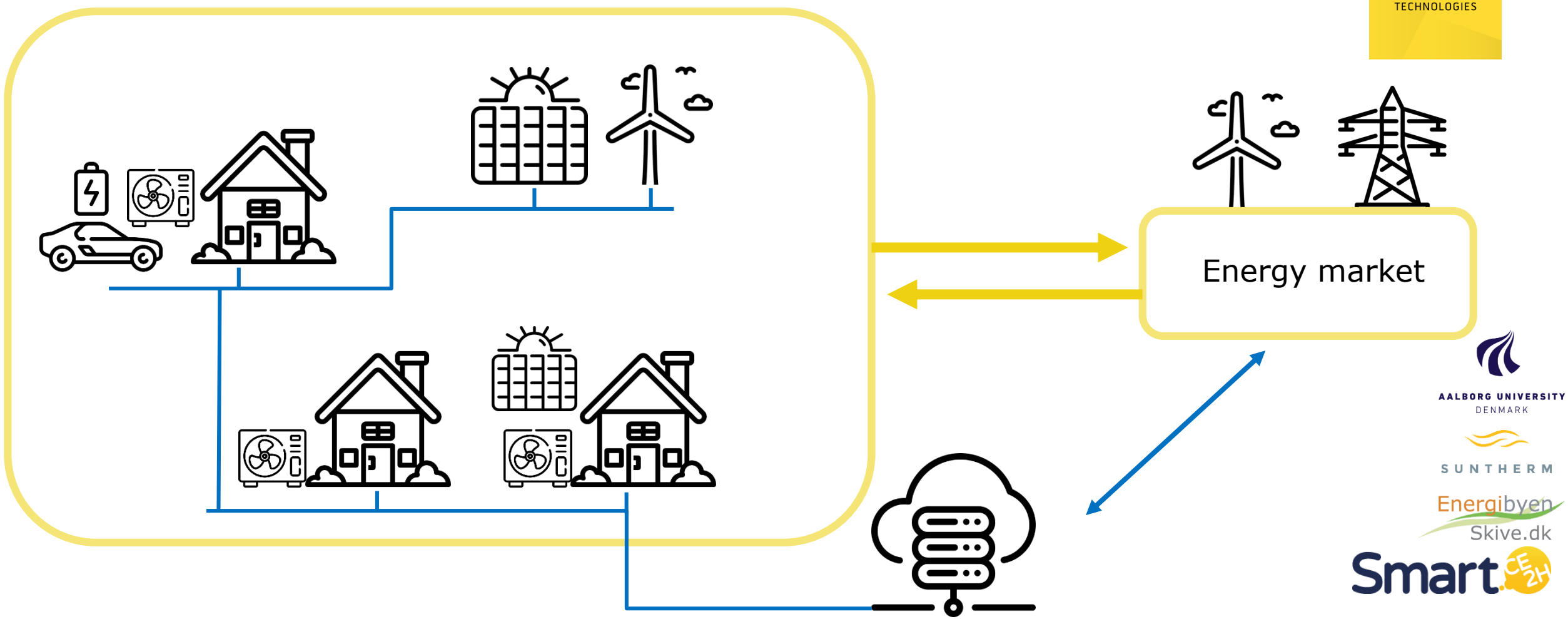
More details on https://www.smartce2h.dk/

A local energy community in the electricity context



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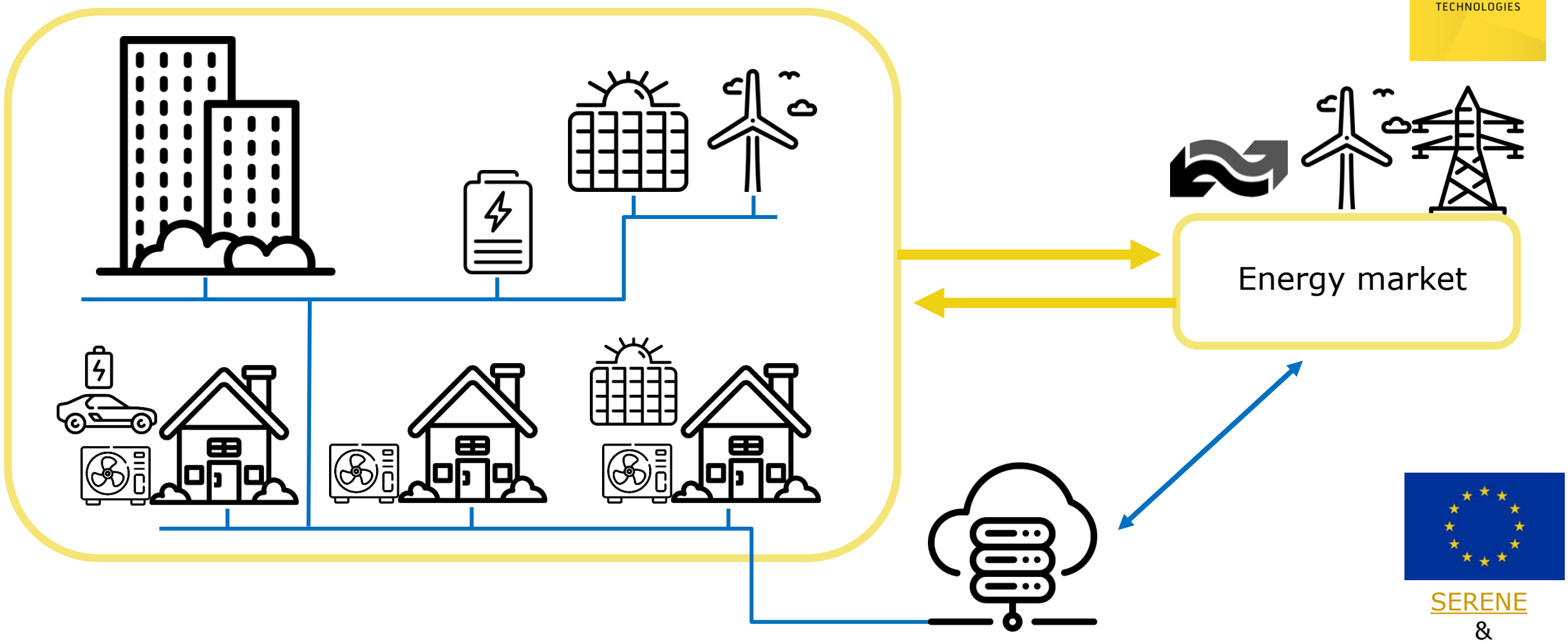
Future cases bring more complex challenges



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Conclusion

Data-driven control can support the energy transition at community level

- Intelligent control concepts are developed within local energy communities
- Optimisation objectives can be varied, according to needs and strategies
- The data required to optimise the community's interaction with the local (regional) energy network is typically not publicly available
- Intelligent control at community level faces regulatory and social challenges:
  - Ownership of common assets and sharing of operational expenses
  - In communities, the human dimension plays a determining role
  - Regulatory frameworks (and price structures) are evolving, but still a barrier at this stage

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