

Contracts in District Heating



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The Importance of Contracts

- Lay out legally binding arrangements between two or more parties.
- Careful contract design can reduce risk for all parties.
- However, all contracts are imperfect, i.e. they don't cover all possible contingencies.
- Contracts should try to cover as many of the most important contingencies as possible
- Contract disputes can be highly costly

Designing contracts

- Standardised contracts mean parties do not have to build contracts from scratch.
- Increases confidence in the contract writing process.
- Reduces costs since process is sped up.
- Standardised contracts can be tailored to include more complex arrangements.
- Trust between parties is an important factor in contracts.
- Parties with an existing relationship likely to value goodwill towards each other. Risk is therefore reduced.

Typical Elements of District Heating Contracts

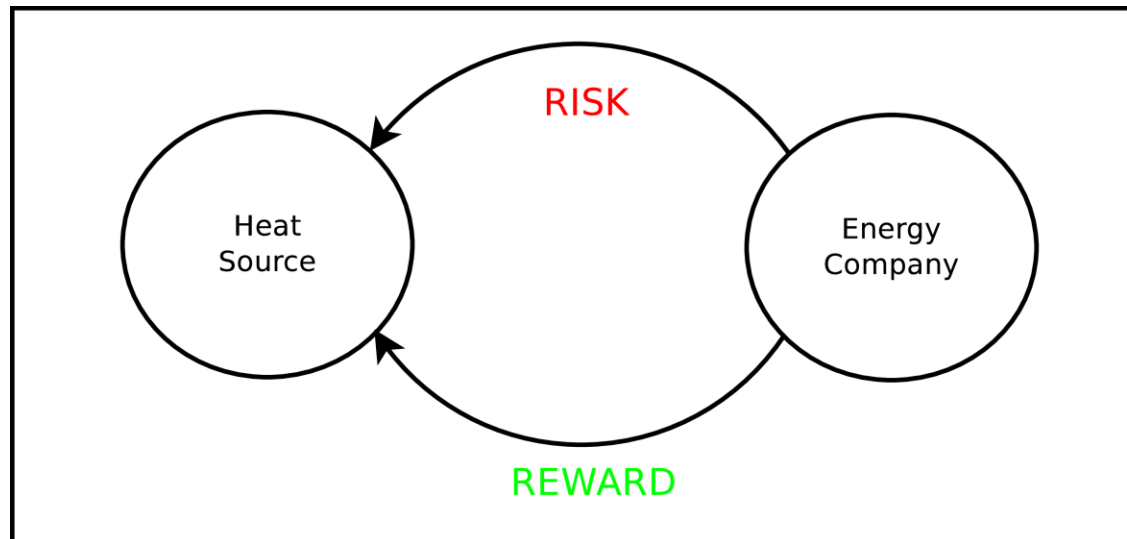
- Supply
- Construction
- Operation
- Maintenance
- Pricing
- Insurance
- Mitigation of risk
- Quality Assurances
- Monitoring
- Billing
- Changes of roles
- Compensation
- Renegotiation
- Disputes

Contracts and Risk Transfer

- Contracts can be considered tools with which to transfer risk and value.
- Risk transfer can be between project partners or to external parties.
- Contracts can be used for risk allocation.
- Effective risk transfer and risk allocation can reduce the costs of a project and improve its viability.

Risk Transfer: example

- Scenario 1: Energy company pays owner of heat source a regular fixed fee for excess heat .
- Scenario 2: energy company pays for heat based on end-user demand. Heat source demands higher return in exchange for heightened risk.



Stakeholder Interviews

- In ReUseHeat, interviews were conducted with 5 different type of stakeholder in a range of European countries:
 - DH operators
 - Policy makers
 - Investors
 - Customers
 - Owners of urban waste heat
- Some questions regarding contracts.
- Aim to capture recurring themes regarding how things are done/difficult issues etc.

Stakeholder Interviews

- Lack of legal framework for low temperature WHR → contracts often have to be built from scratch.
- Standardised contracts used in some cases but often need to be tailored significantly.
- Price of heat depends on season/weather conditions in some cases.
- Feasibility studies often not done due to small scale of project. This makes contract negotiations more difficult.
- Energy companies believe that suppliers of heat often overestimate the value of their heat.
- Long term contracts needed → High degree of trust is required. This is a business risk.

Case study: Brunswick

- Heat pumped from a data centre to a new housing and commercial.
- Development connected to existing network.
- Data centre will provide baseline demand.
- CHPs will cover rest of demand.
- Data centre will save around 10 percent on cooling costs.
- Stakeholders:
 - -Braunschweig Energy – an ESCO (75 percent owned by the city and 25 percent by Veolia).
 - -Data centre owners
 - -Property developer
 - -Customers



Contractual Arrangements

- **Energy Company – Data Centre**
 - How much (if anything) should be paid for heat?
 - What happens during an outage?
- **Energy Company – Property developer**
 - What incentives, if any, should be provided to the property developer to connect the new properties to the network?
- **Energy Company – End users**
 - What tariff should be paid for heat?
 - Should the tariff depend on demand?
- **Property developer – End users**
 - What options do the end users have in terms of energy supply? Alternatives to district heating?

Model Based Contract Design

- KPIs and contract design should be closely linked.
- E.g. the temperature of excess heat produced might impact the price paid.
- Exact temperature likely not known at contract stage.
- Contracts can be conditioned on realised KPI values.
- Modelling can be used to calculate price that should be paid.
- Modelling can be used to perform sensitivity analysis, assess bias etc.
- Working on how exactly modelling should relate to contract design.
- Which sorts of models should be used (simple techno-economic, more complex physical models)
- Specialist software such as EnergyPro or traditional data analysis software such as R, Matlab and Python?

Thanks for listening!



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