HeatCOOP

D3.3

Excel sheet with all relevant financial information and calculations for banks etc.

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1. Executive summary

2. Business models and financial models for Heat Cooperatives

The development of a financial model for a heating cooperative is based on the business model for the decarbonization project which should be realized by the Heating Cooperative.

A business model encompasses always three main components[1]:

The **value proposition** describes what the customer should get by using the products and services of the business. In the case of a decarbonisation project the offered value is the delivery of heating and possibly cooling to the users of one or more buildings or all or individual apartments, respectively, with renewable energy and at affordable cost.

The **Value creation** component includes the key resources and activities which are needed to deliver the products and services. In the case of a decarbonisation project these key resources are the building measures for thermal insulation and the technical installation like probes, heat pumps, pipes and all other elements of the heating/cooling system. The key activities are the operating rules and regulations of the system.

The **Value Capture** component shows the Capital expenditure and their financing structure and cost (including amortization, depending on the business model of the cooperative), the operating expenses, the sources of revenues and the revenue streams by delivering the products and services.

The value capture component can be shown in the framework of a financial model.

[1] Cf Osterwalder, A., Pigneur, Y., & Tucci, C. (2005). Clarifying Business Models: Origins, Present, and Future of the Concept. Communications of the Association for Information Systems, 16, pp-pp. https://doi.org/10.17705/1CAIS.01601. R.Wüstenhagen, J.Boehnke, Business models for sustainable energy, https://www.researchgate.net/publication/36397884_Business_Models_for_Sustainable_Energy

3. Development of financial models

The financial model starts with the analysis of the economic feasibility of the decarbonisation project based on the estimated CAPEX (investment cost) and OPEX (operating cost) of the project and translates these costs based on an assumption of the financial sources and financing cost into an annualized cash outflow plan.

		Year 1	Year 2	Year 3	,,,,,,,,,	Year 20
Capex	Financial sources					
x	Equity %	x%				
	Investment subsidy%	x%				
	Debt%	x%				
	Interest	n	n	n	,,,,,,,	n
	Debt repayment	n	n	n	,,,,,,,,	n
Re-investment				n	,,,,,,,,	n
Opex						
Power, utilities		n	n	n	,,,,,,,,	n
Operating cost		n	n	n	,,,,,,,,	n
Maintenance cost		n	n	n	,,,,,,,,	n
Repair		n	n	n	,,,,,,,,	n
Public fees, taxes etc.		n	n	n	,,,,,,,,	n
Administration cost		n	n	n	,,,,,,,,	n
Other		n	n	n		n

Figure 1 – Capex & Opex

The economic feasibility of the whole project can be derived from a comparison of the cash outflow (including interest and debt amortization, depending on the business model of the cooperative) of the decarbonisation project with the "baseline scenario" of the cash outflow for the existing heating system, based on an estimate of future energy consumption and future cost of the energy source used for the existing system. The difference between the cash outflow for the new heating system and the cash outflow in the baseline scenario (usually mainly energy cost savings) constitute the positive (or negative) net-cash flow of the decarbonisation project based on which, typically by applying a discounted cash flow methodology, the feasibility of the project can be evaluated. Besides, also the return on equity can be established

The financial plan for the heat cooperative is derived as a carve-out of the cash outflow plan for the total project depending on the selected business model for the heat cooperative.

Criterion	Administrative Cooperative	Leasehold Cooperative	Asset Cooperative
Ownership of assets	No	No	Yes
Role of the cooperative	Operator/ administrator	Operator under lease	Owner and operator
CAPEX responsibility	Not included	Not included (embedded in lease fee)	Fully included
OPEX responsibility	Fully included	Fully included	Fully included
Leasing / rental payments	No	Yes	No
Balance sheet includes assets	No	No	Yes
Revenue generation	No commercial revenues; cost reimbursement	Revenues from heat supply	Revenues from heat supply
Financial planning scope	OPEX estimation only	OPEX + leasing + revenues	OPEX + CAPEX + revenues
Economic complexity	Low	Medium	High

The difference between the models lies primarily in the degree of investment responsibility and economic risk assumed by the energy community – from simple cost allocation to a full-fledged investment and supply model.

3.1. Administrative cooperative

The administrative cooperative has been assigned the operation of the heating system (or parts of it) and covers the operating expenses as shown below, but no capex-related expenses. It will reclaim this cost from its members on the title of cost refund. The financial plan can be limited to the estimation of operating expenses.

Economic character:

"Cost-sharing mechanism without investment exposure."

- The economy is based solely on sharing operating costs
- There is no revenue in the true sense of the word – only OPEX refunds

- Return on investment and financing are not addressed
- Suitable for:
  - Small communities
  - Low development ambitions
  - Situations with an external technology owner

			Year 1	Year 2	Year 3	,,,,,,,,	Year 20
	CAPEX	Financial sources					
	x	Equity %	x%				
		Investment subsidy%	x%				
		Debt%	x%				
		Interest	n	n	n	,,,,,,,,	n
		Debt repayment	n	n	n	,,,,,,,,	n
		Re-investment				,,,,,,,,	n
Financial plan of administrative cooperative	**OPEX**						
	Power, utilities		n	n	n	,,,,,,,,	n
	Operating cost		n	n	n	,,,,,,,,	n
	Maintenance cost		n	n	n	,,,,,,,,	n
	Repair		n	n	n	,,,,,,,,	n
	Public fees, taxes etc.		n	n	n	,,,,,,,,	n
	Administration cost		n	n	n	,,,,,,,,	n
	Other		n	n	n		n

Figure 2 – Financial plan of administrative cooperative

3.2. Leasehold cooperatives

A leasehold cooperative similar to the administrative cooperative is established as operator (and not as asset owner) of the heating system, but its expenses include also a leasing fee, which usually corresponds to the capex-related expenses of the landlords/ investors who remain asset owners.

- Komunita provozuje systém, ale investice jsou externalizovány
- Leasingové platby nahrazují CAPEX → fixní náklad
- Nutnost:
  - plánovat cash inflow
  - stanovovat ceny tepla / poplatky
- Riziko je omezené, ale již existuje závislost na tržbách

Ekonomický charakter:

„Operational business model with outsourced investment risk."

			Year 1	Year 2	Year 3	,,,,,,,	Year 20
	CAPEX	Financial sources					
	x	Equity %	x%				
		Investment subsidy%	x%				
		Debt%	x%				
		Interest	n	n	n	,,,,,,,	n
		Debt repayment		n	n	,,,,,,,	n
	Re-investment					,,,,,,,	n
Financial plan of leasehold cooperative	**Leasing fee**	*Corresponds to Interest and Debt repayment*		n	n	,,,,,,,	n
	OPEX		n	n	n	,,,,,,,	n
	Power, utilities		n	n	n	,,,,,,,	n
	Operating cost		n	n	n	,,,,,,,	n
	Maintenance cost		n	n	n	,,,,,,,	n
	Repair		n	n	n	,,,,,,,	n
	Public fees, taxes etc.		n	n	n	,,,,,,,	n
	Administration cost		n	n	n	,,,,,,,	n
	Other		n	n	n		n

Figure 3 – Financial plan of leasehold cooperative

For the leasehold cooperative also a cash inflow plan for calculating its revenues is needed. The legal title of the revenues usually will be the earnings for heat supply, which might be based either on the membership

rights (established in the statutes of the cooperative), or a supply contract.

3.3. Asset cooperatives

As the asset cooperative has a balance sheet which includes also the assets of the heating system, it has to consider also the Capex-related expenses as a part of its cash outflows. Additionally, a cash inflow plan for calculating its revenues is needed. The legal title of the revenue usually will be the earnings for heat supply to its members. Also, for the asset cooperative these revenues might be based either on the membership rights or on a supply contract.

- Komunita je:
  - investorem
  - vlastníkem
  - provozovatelem
- Ekonomika musí řešit:
  - návratnost investice
  - financování
  - dlouhodobou udržitelnost
- Nejvyšší autonomie, ale také nejvyšší odpovědnost

Ekonomický charakter:

„Fully integrated investment and supply business model."

			Year 1	Year 2	Year 3	,,,,,,,,,	Year 20
Financial plan of asset cooperative	**CAPEX**	Financial sources					
	x	Equity %	x%				
		Investment subsidy%	x%				
		Debt%	x%				
		Interest	n	n	n	,,,,,,,,	n
		Debt repayment		n	n	,,,,,,,,	n
	Re-investment				n	,,,,,,,,	n
	OPEX		n	n	n	,,,,,,,,	n
	Power, utilities		n	n	n	,,,,,,,,	n
	Operating cost		n	n	n	,,,,,,,,	n
	Maintenance cost		n	n	n	,,,,,,,,	n
	Repair		n	n	n	,,,,,,,,	n
	Public fees, taxes etc.		n	n	n	,,,,,,,,	n
	Administration cost		n	n	n	,,,,,,,,	n
	Other		n	n	n		n

Figure 4 – Financial plan of leasehold cooperative

4. Content of the Business Plan and the Financial Plan

On this basis the planning for the income statement, the balance sheet statement and the financial planning can be established using a financial planning tool.

Summing up, the business plan and the financial plan depend on the chosen Business Model for the cooperative and on the decision by the project initiators how much assets and financial liabilities the cooperative should take on its balance sheet.

The **description of the business plan** should cover the three main elements:

The **value proposition**: the details of the delivery of heating (and possibly cooling) with renewable energy, the consumers of energy (i.e. the members), and the details of the heat supply contract (quantity, prices, supply terms).

The **Value creation** element should be described by the technical implementation and operation concept of the decarbonisation project.

The **Value Capture** component shows the Capital expenditure and their financing structure and cost, the operating expenses, the sources of revenues and the revenue streams through delivering the products and services using the financial model and the cash flow and balance sheet planning. Some general considerations should be included here:

5. General Considerations

For the financial and balance sheet planning liquidity reserves for working capital and debt servicing are required. The cooperative should not face any financial shortfall from payables and for repayment and interest, even under stress scenarios.

The business plan must not only describe the main **planning assumptions** (as shown in the financial plan) but should also explicitly describe and discuss risks.

Market risks and price risks are only important for the heating cooperative in the area of operating costs and can be mitigated by a corresponding heat price adjustment.

For Leasehold and Asset cooperatives depending on their revenues to cover their expenses, the issue of **credit risk** (the ability to pay for heat supply) of their members/customers exists. Even if these cooperatives do not supply energy to the market, but to their members as personally known and defined energy consumers at prices that are derived from the cooperative's asset and financing structure in consultation with the cooperative members, the cooperative is finally depending on the creditworthiness of its members. The solvency and creditworthiness of its energy consumers/members are all the more important, because they cannot be replaced by other customers on the market at any time if they do not (cannot) pay. The solvency of the cooperative therefore depends on this credit risk, which is structurally similar to the creditworthiness risk when renting. This risk must be assessed and considered for each member as energy consumer.

Risks and additional costs related to debt financing

For raising debt financing required to co-finance the Capex of the decarbonization project the landlord/investors, or the asset cooperative will have to provide appropriate security to the financing banks. This usually comprises tangible security such as mortgages or asset encumbrances and cash-flow related securities, such as an assignment of the future income streams generated by the project. The latter encompasses an analysis of the credit risk as referred to above.

In case the bank concludes that the value of the project related securities was insufficient, it would require additional securities from the landlord/investors or asset cooperative, such as cash deposits or guarantees. The latter would require taking into account respective opportunity cost (foregone interest, guarantee fees) as part of the Capex of the project.

For a bank it is important that securities established/provided for the loan remain unchanged also in case of a sale or transfer of the building/apartments concerned, which requires appropriate agreements between the bank and the owners of the building and project assets as well as operators of the project assets.