Evaluation of Peer-to-Peer Electricity Sharing Communities and Platforms

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FCN | Future Energy Consumer Needs and Behavior

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Outline

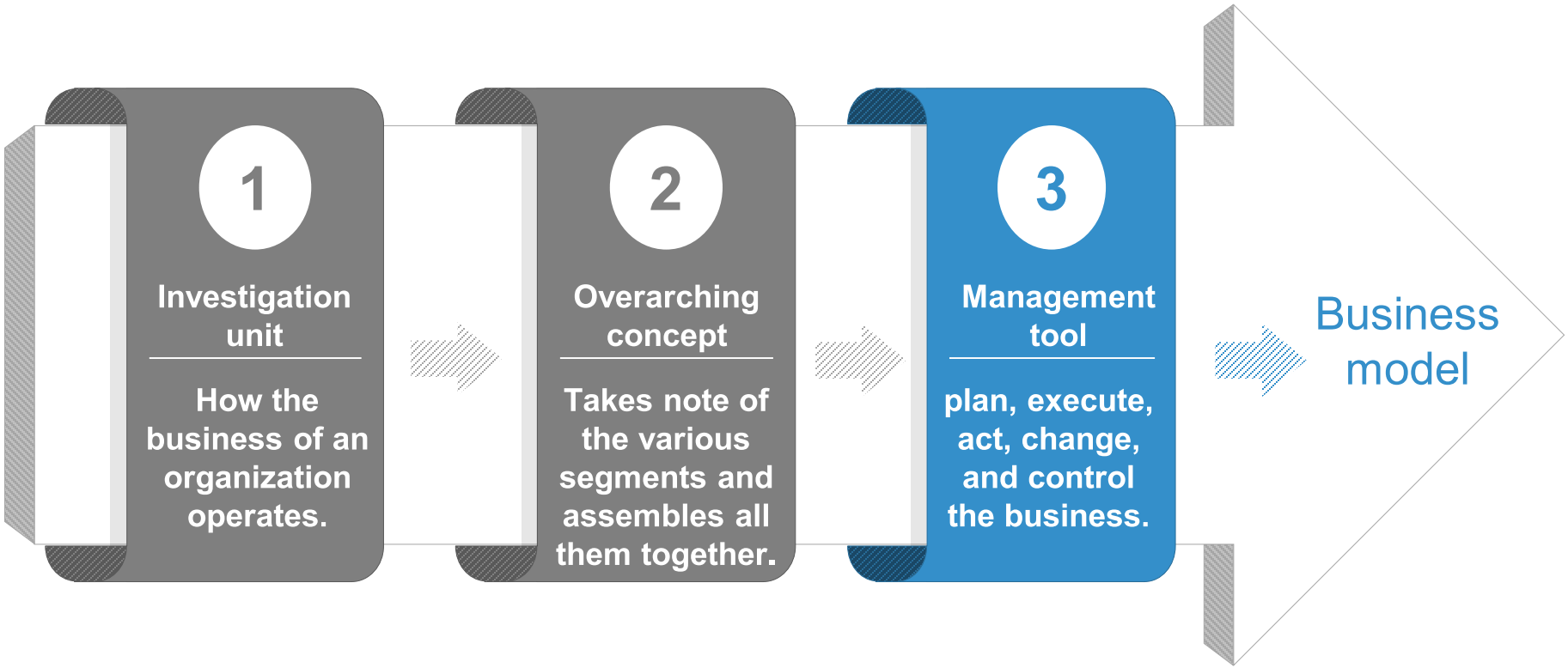
1. Introduction	• Research Motivation
2. Business model	• Business Model Canvas
3. Methodology	• Research process • Case study selection • Data analysis
4. Results	• Value creation (by actor category)
5. Conclusion	• Implications for future research

1. Introduction

- **Self-consumption** and **electricity sharing** in a community of prosumers is becoming more beneficial.
- Evaluation of **business models** of innovative peer-to-peer energy-sharing communities and platforms **across Germany** in a systematic way.
- **Induced impacts** on the electricity grid and market. Reduced emergency measures during the **grid bottlenecks**.
- **Created value** through the energy communities and platforms such as lower electricity **prices**, **independence** from utilities etc.

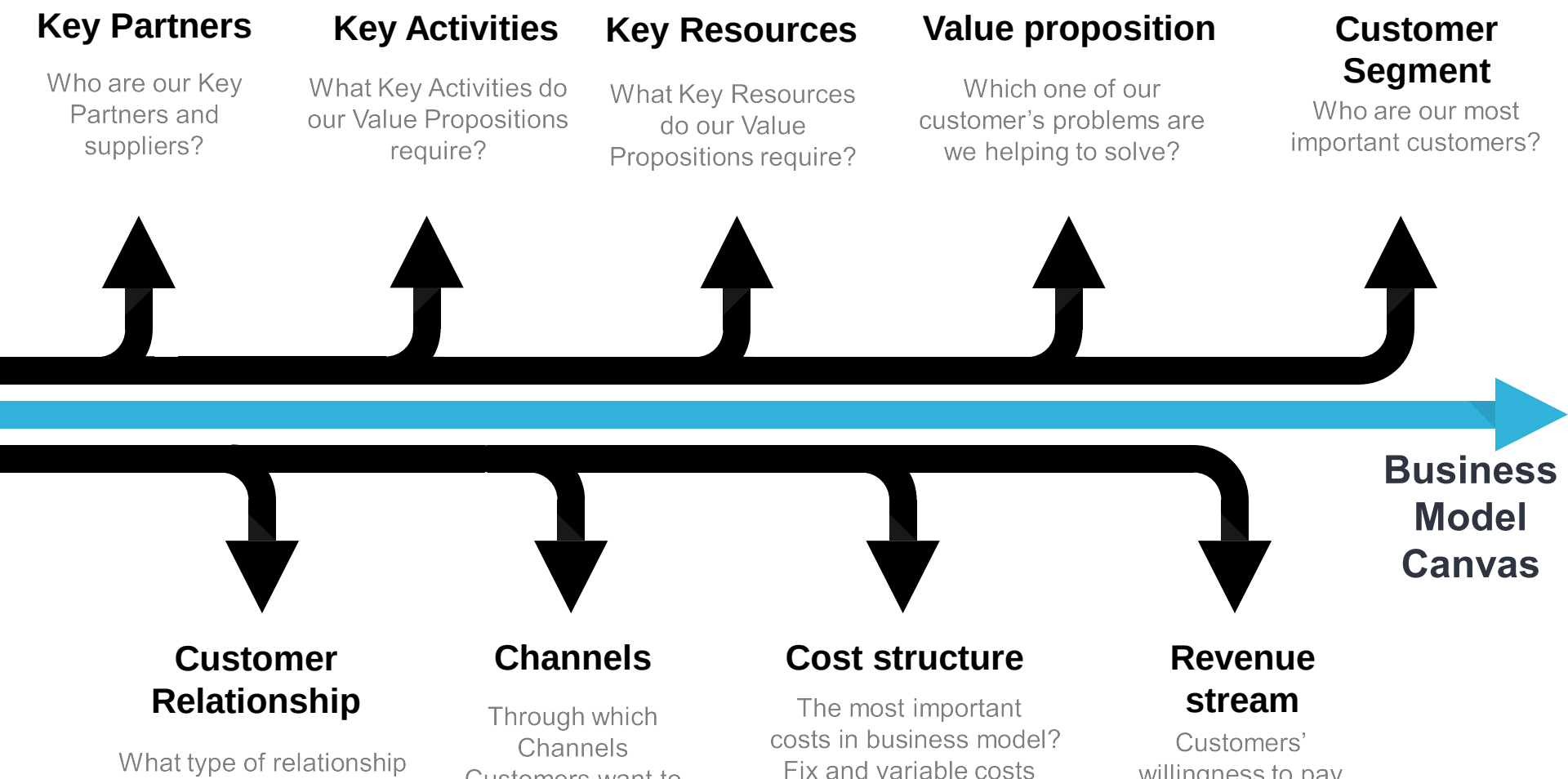
2. Business model development

Business Model Canvas



Johnson (2010)
Osterwalder and Pigneur (2010)

2. Business Model Canvas (Osterwalder and Pigneur 2010)



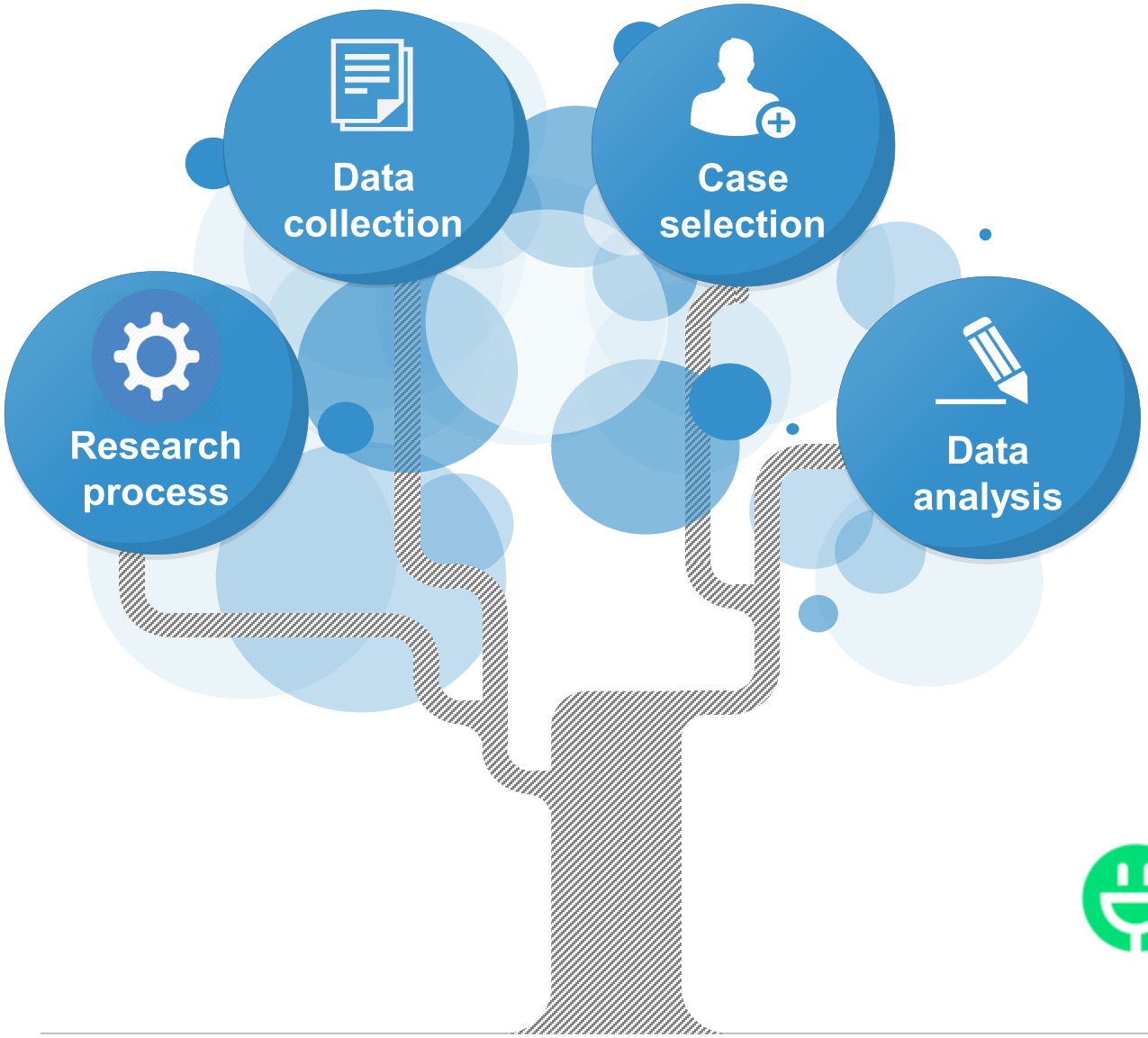
Related Literature, Aim & Scope, Original Contribution

Related Literature:
Zepter et al. (*Energy & Buildings*, 2019)
Zhang et al. (*Applied Energy*, 2018)

Aim & Scope:
* Business model development for peer-to-peer electricity sharing platforms

Original contribution of present research:
- First study applying the BMC to peer-to-peer electricity trading
- Review of selected pooling businesses in Germany
- Extraction of patterns used by companies and value created for actors

3. Methodology



sonnen

e·on

SENEC

enyway

Lition
Good Energy

Data Collection, Case Selection, Data Analysis

Data collection

- 5 peer-to-peer energy service providers (SonnenCommunity, e.on SolarCloud, SENEC, Lition and Enyway)
- Annual Reports, Company websites, brochures, customers

Case selection

- Focus on Germany
- Supply of renewable energies only
- Focus on residential customers (B2C)
- Companies having energy sharing platforms

Data analysis

- Applying the BMC in a systematic way
- Grouping of distinct features
- Cross-case analysis

SonnenCommunity – Value proposition

- Around 30,000 batteries in Europe, a capacity up to 300 MWh.
- **Integration** of renewable energy resources and battery storage systems
- Offering a high **flexibility** by energy management and **DSM**
- **Independence** and clean energy for household
- **Sharing surplus energy** among community members
- Provision of stabilized and **competitive prices** for all customers
- Free energy according to the selected **flat rate**
- Creating **individual power profile** according to the consumption and generation via weather forecast

SonnenCommunity – BMC analysis

Key Partners Insert

Prosumers especially households with battery storage systems. Solar systems are the most important part of the sonnenCommunity as they supply the energy network with clean solar power.

Operators of decentralized generation plants e.g. for example, wind turbines, biogas plants or large PV plants

Key Activities Insert

1.Installation and operation of battery storage systems

2.Interconecting the Sonnen battery members through SonnenCommunity

3.Virtual energy storage pool operator as a platform for the community for trading

4.Smart home and electromobility solutions

Key Resources Insert

1.Software technologies for the storage pool (Sonnen power sharing platform)

2.Integrated battery storage systems

Value Proposition Insert

1.Integration of 100% renewable (PV) energy

2.Offering a high flexibility by energy management and DSM

3.Independence and clean energy for household

4.Sharing surplus energy among community members

5.Provision of stabilized and competitive energy prices (selling/buying) for all customers

6.Provision of domestic energy optimization and storage solutions

7.Creating individual power profile according to the consumption and generation via weather forecast

8.Free energy according to the selected Flatrate (Electricity for 0 EUR with the solar battery)

Customer Relationships Insert

1.On-site visit

2.Customer service team

3.After sales services

4.Call center

6.Customer portal, Energy apps

7.Telephone and email

8.Live chat

Channels Insert

1. Press and media

2.Social media

3.Company's website

Customer Segments Insert

1.SonnenCommunity for all domestic consumers

2.Flatrate membership only for households with at least 6Kwh solar capacity

Cost Structure Insert

1.Infrustructures,
2.Technology,
3.Software,
4.Contracts,
5.Staff,

Revenue Streams Insert

1.SonnenBattery ~4000 EUR

2.Subscription of the Community membership ~20 EUR/month

e.on SolarCloud – Value proposition

- Empowering prosumers to virtually store their own generated solar electricity in SolarCloud platform and consume it anytime.
- Charging EV with the stored energy from SolarCloud.
- Offering SolarCloud to customers without local electricity storage. It saves customers the costly investment in a storage battery and let them to use 100% of their solar power.
- With the all-risks insurance, the solar system is protected against external damage (hail, storm theft, etc.)
- Monitoring the efficiency of the plant online and detect deviations early through the innovative efficiency check.

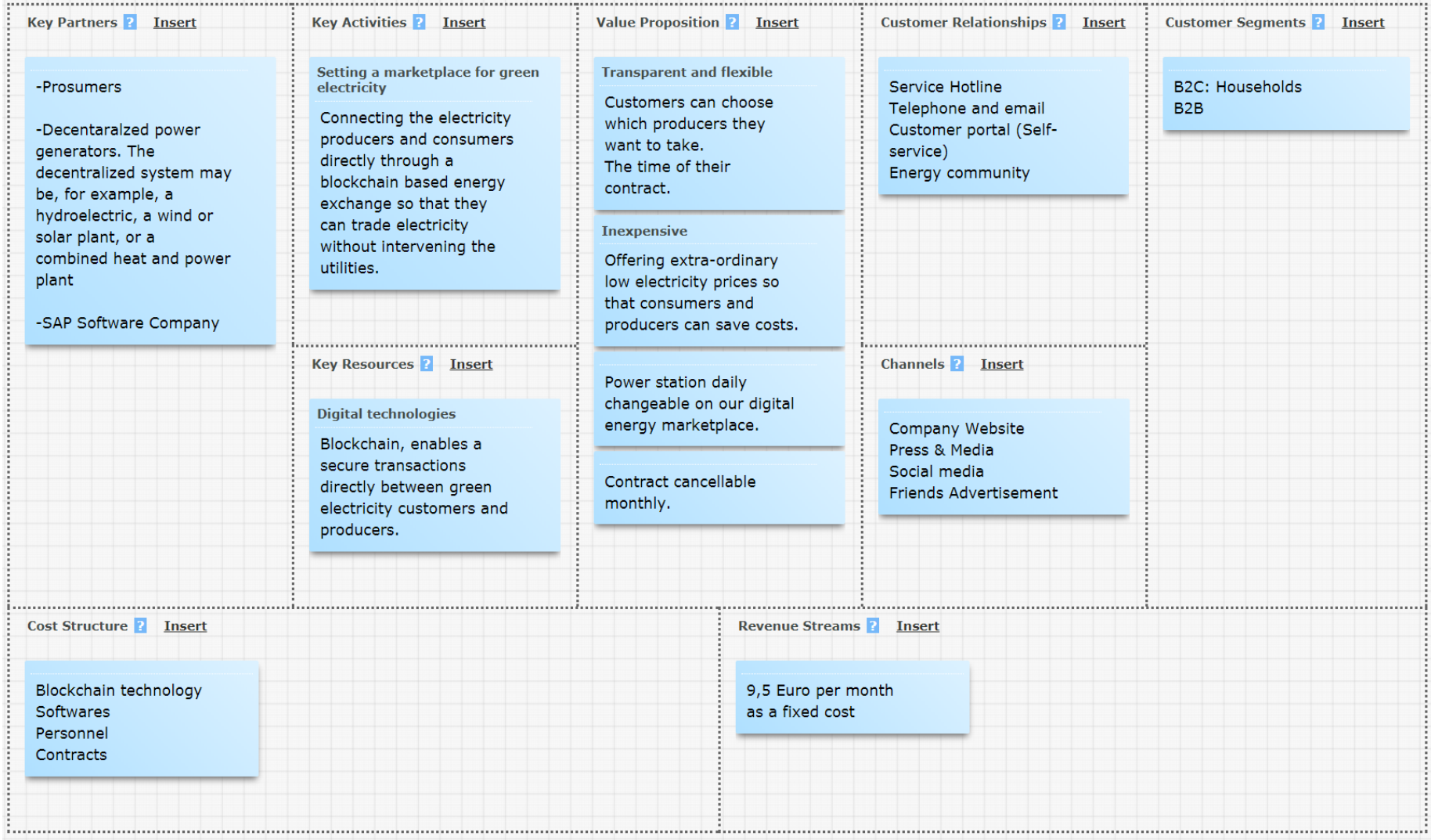
SENEC – Value proposition

- Manufacturer of electricity storage systems, owned subsidiary of EnBW Energie Baden-Württemberg
- The SENEC.Cloud makes people independent of rising electricity prices and provides them self-generated electrical energy.
- Excess energy is "paid in" like a virtual electricity account can be used self-energy supply or for charging EVs.
- Become an independent self-powered electricity supplier with the SENEC.Cloud; buying less energy from the public network
- SENEC.Cloud enables to use the power from the cloud at up to two additional points of sale in Germany.

Lition – Value proposition

- Connecting the electricity producers and consumers directly through a blockchain based energy exchange community platform so that they trade electricity without intervening the utilities.
- Blockchain, enables a secure transactions directly between green electricity customers and producers.
- Customers can choose which producers they want to take during the time of their contract.
- Offering extra-ordinary low electricity prices so that consumers and producers can save costs.
- Power station daily changeable on the digital energy marketplace.

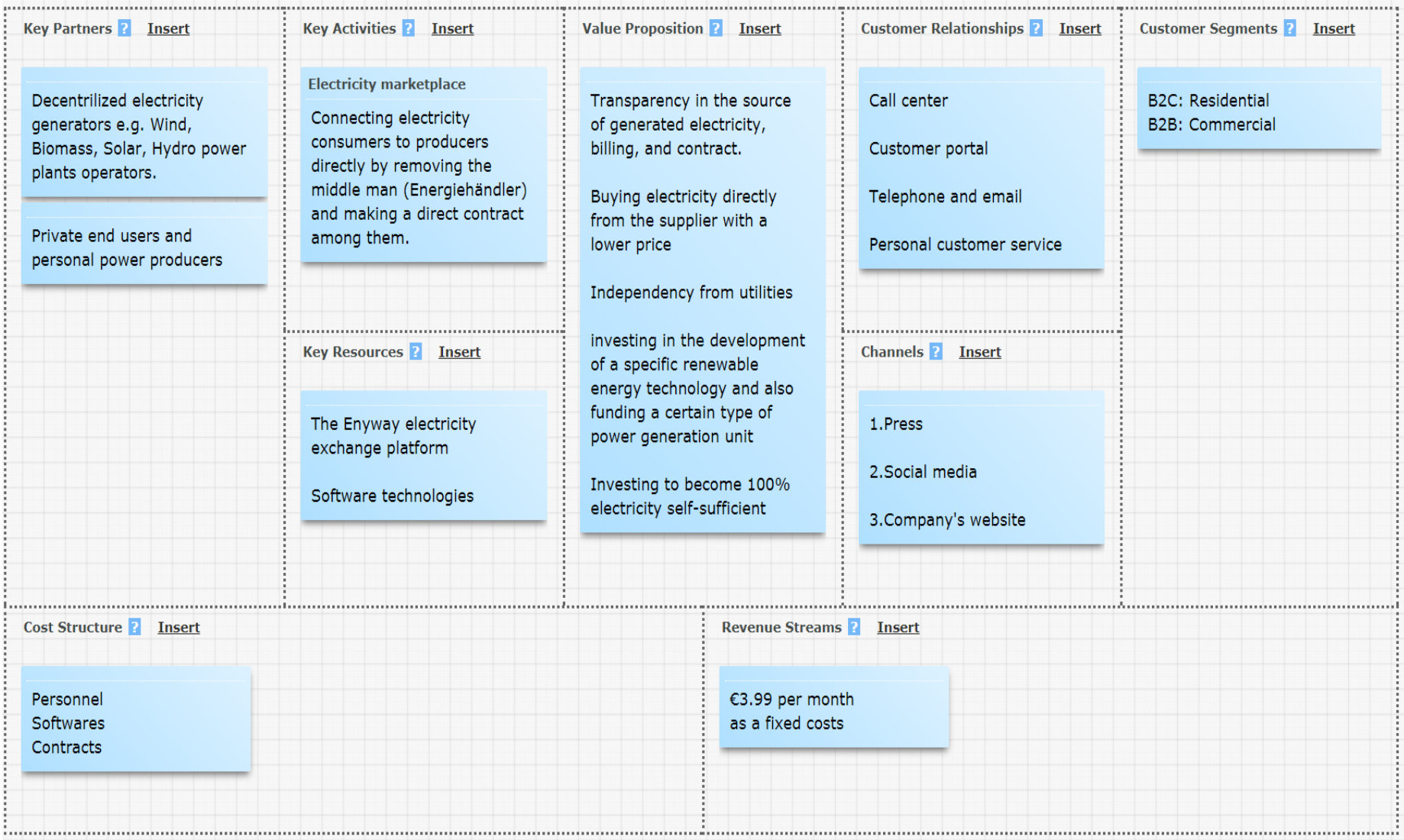
Lition – BMC analysis



Enyway – Value proposition

- Connecting electricity consumers to generators directly by removing the middleman and making a direct contract among them.
- Transparency in the source of generated electricity, billing, and contract.
- Buying electricity directly from the supplier with a lower price
- investing in the development of a specific renewable energy technology and also funding a certain type of power generation unit
- Investing to become 100% electricity self-sufficient

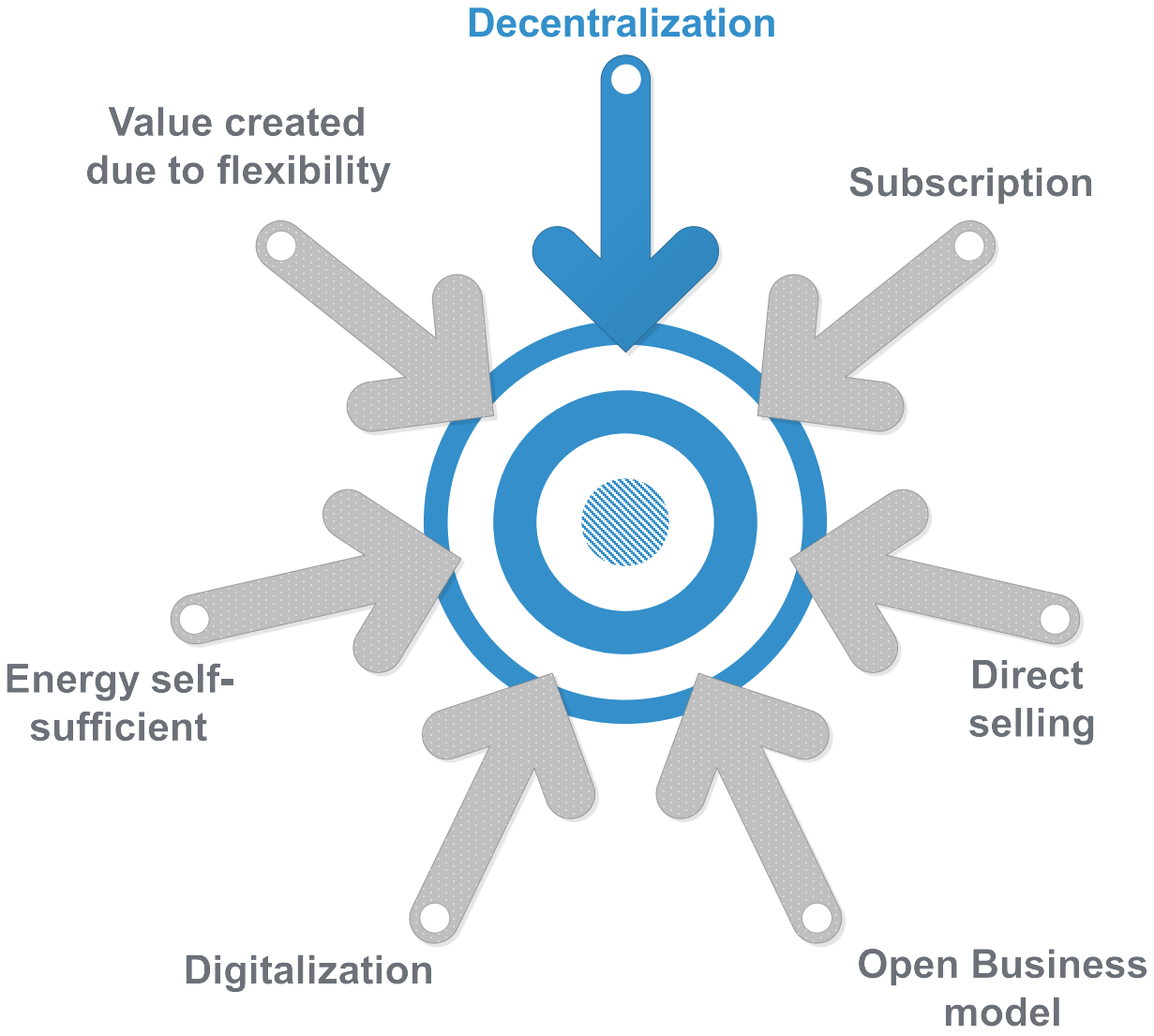
Enyway – BMC analysis



4. Key Results

Peer-to-peer electricity trading and energy platforms:

1. **Subscription fee:**
   Customers' **regular fee** payment to access to service. Company's steady income stream.
2. **Open Business:**
   Collaboration with suppliers and customers in the ecosystem for value creation and extending business.
3. **Direct selling:**
   Electricity is sold directly to the customer, **skips the retail** margin or any additional costs associated with the intermediates
4. **Digitalization:**
   Turning the electricity and services into digital variations via **digital technologies**, and creating value.



5. Conclusions

- 1. BMI can limit the power grid expansions and prevent extra costs:
  Due to the **integration** of decentralized renewable energies into the power system and **added flexibility**, the need for **expanding the grid** infrastructure especially in bottlenecks is decreased and the grid can be **more stabilized**.

- 2. Higher energy self-consumption and lower electricity costs:
  Participants can benefit from cost reductions by **consuming less** energy from the grid which is more expensive and become **energy self-sufficient**.

- 3. Government Policymakers pay more attention to start-ups and increase the market competition:
  Since business model innovation is highly subject to the **regulatory framework, politics** is able to make a solid effect on sustainable business model development.

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