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Which business model adaption or innovation in the German biogas sector?

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Context

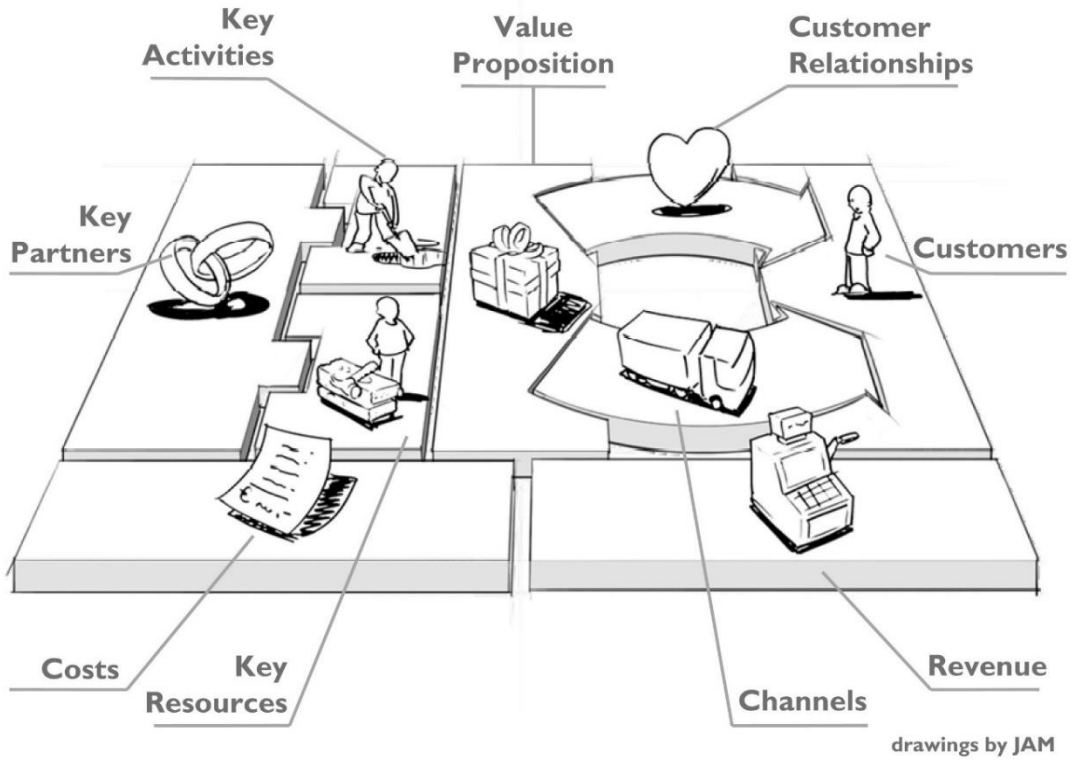
- In Germany, real biogas boom since 2000 due to financial incentives from the government
- Currently, around 9,500 biogas plants in Germany
- With the feed-in tariffs, electricity is subsidised and can be sold for 13-15 cent per kwh
- However, feed-in tariffs are limited to 20 years, and then, electricity is subjected to open market prices which are ca. 4 cent per kwh

Research question & objective

- Will the biogas sector remain as it is with electricity-heat-fertilizer outputs or will there be a strategy change with new products and markets?
- If so, what are the options for businesses (product specialisation, new biorefinery platforms, new cooperation forms)?
- **Objective**: understand how businesses in the German biogas sector adapt their business models and strategies in response to external changing political and market conditions

Theoretical background

- **Business model**: describes how a firm operates and how it creates value for its stakeholders
- Businesses obliged to adapt and innovate their models and strategies because of e.g. market liberalisations, new technologies, increased competition, changing socio-economic conditions (Taran et al., 2015).
- **Business model adaption** = "*the process by which management actively aligns the firm's business model to a changing environment*" (Saebi et al., 2017)
- **Business model innovation** = radical innovation of the core business model itself in order to *disrupt* market conditions.



Methodology

- Study of two business cases (interviews, field visits) in Germany within the H2020 NoAW (No Agricultural Waste) project
- Both cases tarted early with anaerobic digestion and then developed their activities in response to changing institutional and market conditions
- Analysis of the development and innovation strategies applied by the businesses

Case 1

Beginning: main goal of the farmer to profitably convert pig slurry from animal husbandry into biogas via anaerobic digestion.

- Later: enlarge biogas plant in order to create economies of scales for re-investments (from 55 kWe to 300 kWe).
- Start pelletized fertilizer production and marketing as the area to spread digestate and nutrients would become a limiting factor.
- Supply heat to a nearby eco-village via a district heating grid.
- Currently: aim to sell electricity to an e-car sharing initiative.

Case 2

- Food-energy park founded in 2016 by several partners with various backgrounds and knowledge
- Objective: build a network and attract investors who would enable the implementation of a circular economy approach around the biogas plant.

- Technology development hub: create “modules” such as humus / biochar, Macroalgae project using heat and digestate, exploit heat from the biogas plant for drying herbs; objective to market these modules via franchising.
- For the biogas plant, energy crops already substituted by horse manure due to the policy change regarding limited use of energy crops in biogas plants.
- As prices for electricity decrease – because of the new regulation of tendering electricity from diverse renewable energy sources (e.g. solar, wind) – plan to directly use it for rooftop greenhouses.

Results

- Both cases modify business models in terms of new value propositions, resources, partners, and distribution channels.
- Strategies based on *technological* (developing modules), *product* (pelletized fertilizers, humus), *marketing* (electric car-sharing, eco-village) *and/or organisational innovation* (cooperation). Innovations partly supported by public funding.
- While the first case aligns to the changing institutional and market conditions via a stepwise *adaption strategy*, the second one is also based on an *innovation of the business model itself* by creating a new firm with a technology development hub.

Conclusion

- Business innovations in the German biogas sector strongly driven by the question for business managers of how to survive after 20 years' subventions via feed-in tariffs, and the introduction of the new regulation for tendering electricity from various competitive renewable sources.

- Insights only based on two explorative cases, large-scale survey among biogas plant owners in Germany needed to develop business recommendations.

Thank you very much for your attention!

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