

Energy Business and Innovation

Session 9 – Business models

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Outline

- 1. What is a business model and why it matters?**
- 2. Utility and consumer side business models**
- 3. Examples**
- 4. Business model innovation exercise**

Warm-up

What do you think are great examples of business model innovations in the energy sector?

Think for a moment, answer in chat

Business model basics

Business model thinking

“All it really meant was how you planned to make money” (Lewis 2000)

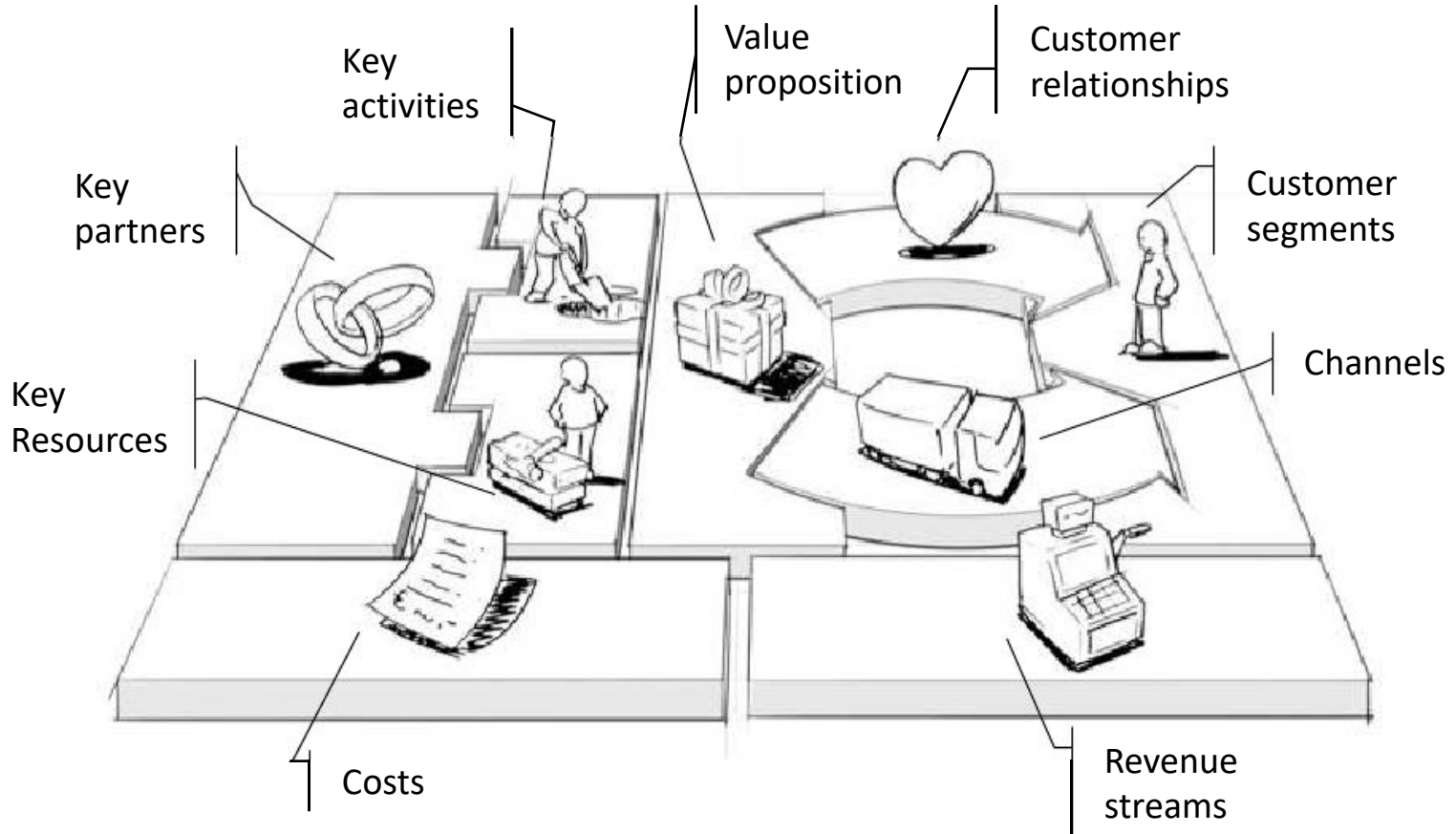
Joan Magretta: ‘Who is the customer? And what does the customer value?’ It also answers the fundamental questions every manager must ask: How do we make money in this business? What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost?’ referencing to Peter Drucker (1909-2005)

Business model thinking

The essence of a business model is in defining the manner by which the enterprise delivers value to customers, entices customers to pay for value, and converts those payments to profit (Teece 2010)

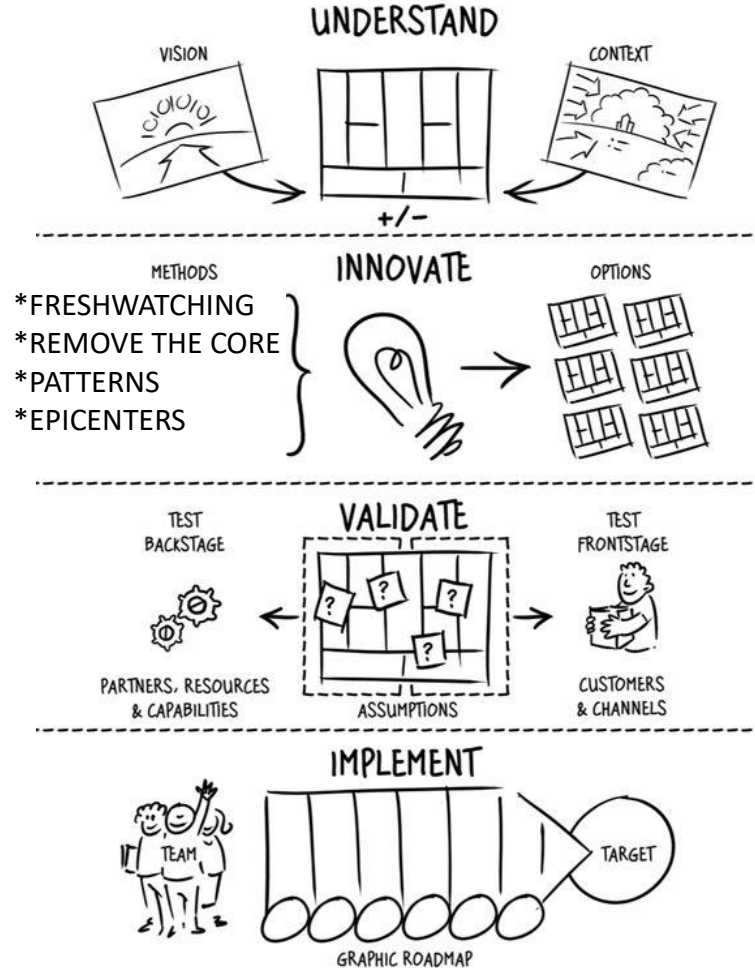
“the rationale of how an organization creates, delivers, and captures value” (Osterwalder, Pigneur 2009)

Business model canvas



A?

Process view



Why is business model thinking important?

- A valuable tool for analysis and management in research and practice
- For industries undergoing fundamental changes.
- The business model concept enables the examination and comparison of markets and companies in a structured way, thus, providing the basis for the identification of critical success factors.
- The business model helps managers to capture, visualize, understand, communicate and share the business logic.
- Appropriately designed model is important opportunity to overcome some of the key barriers to the market diffusion of sustainable energy technologies.

Business models in the energy transition

Electricity value chain



- **Generation of electricity means the transformation of primary energy resources into electric power.**
- **Transmission comprises the transport of electricity at high voltage over long distances via the transmission grid.**
- **Distribution networks are designed to deliver electricity to the end customers at low voltage level.**
- **Retail can be considered a mainly administrative task that includes the communication with the end customer. Retailers purchase power from producers, traders, or an exchange and sell it to end customers.**
- **Consumption of energy takes place on the customer-side of the meter.**

Two generic business models for RE (Richter, 2012)

Typical technologies are on- and off-shore wind farms, large scale photovoltaic projects, biomass power plants, and solar thermal power plants

What is new is that renewable energy enables consumers to become energy producers as well.



Utility side models

- **Conventional utility**
- **Green utility**
- **Cooperative utility**

(Bryant et al. 2021)

Conventional model

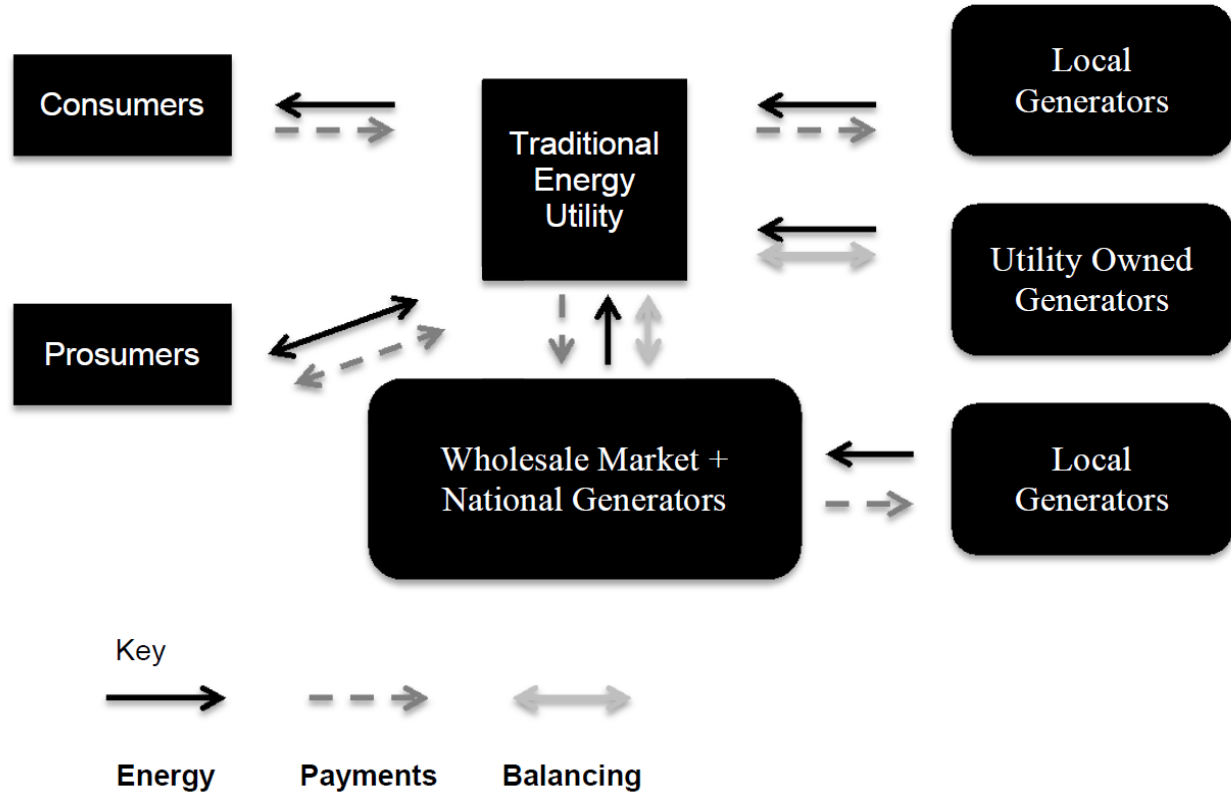
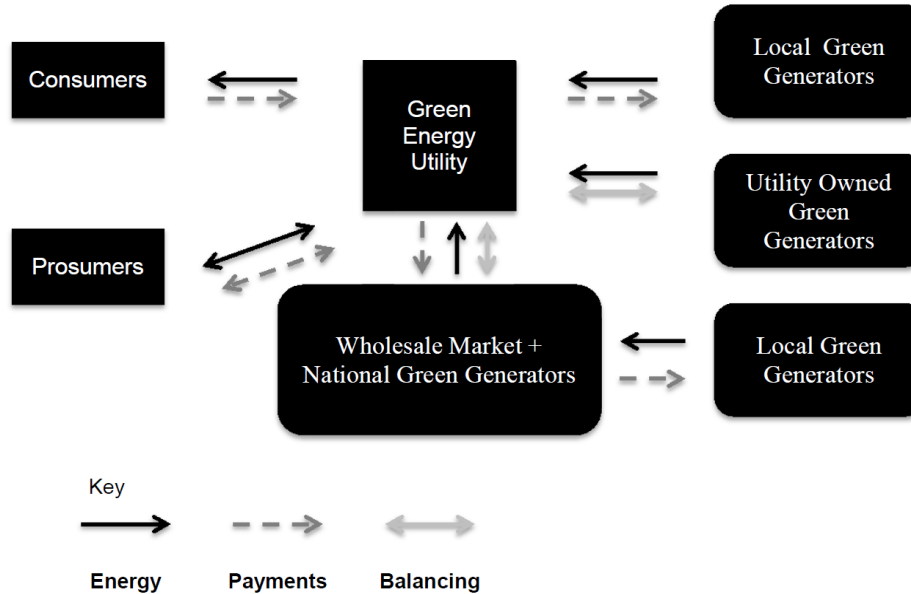


Figure 2 - The traditional energy utility business model (adapted from Hall & Roelich (2016))

Green utility



Customer Segment	Typically focuses on energy supply to residential and small commercial customers
Customer Relationship	Seen as an ethically superior alternative to the traditional utility
Channels	Energy bill + customer engagement updates
Value Proposition	Provision of predominantly green/renewable electricity & gas at a cost-competitive price, reliably
Key Activities	Green electricity generation, deployment of new renewable capacity, energy trading, retail sale green gas & green electricity
Key Partners	Energy market regulator, grid operators, energy suppliers
Key Resources	Renewable generation infrastructure, customer-base, green image
Cost Structure	Renewables deployment, asset operation & maintenance, customer admin, staff, wholesale energy purchases, network charges
Revenue Stream	Energy (electricity, gas, heat) sales

Example - Acciona

- **Acciona is a Spanish energy utility, with 100% renewable energy capacity**
- **~11 GW of capacity installed at the end of 2021**
 - 74% wind, 13% solar PV
- **Also invests a lot in energy storage solutions, including green hydrogen pilot**



Cooperative utility

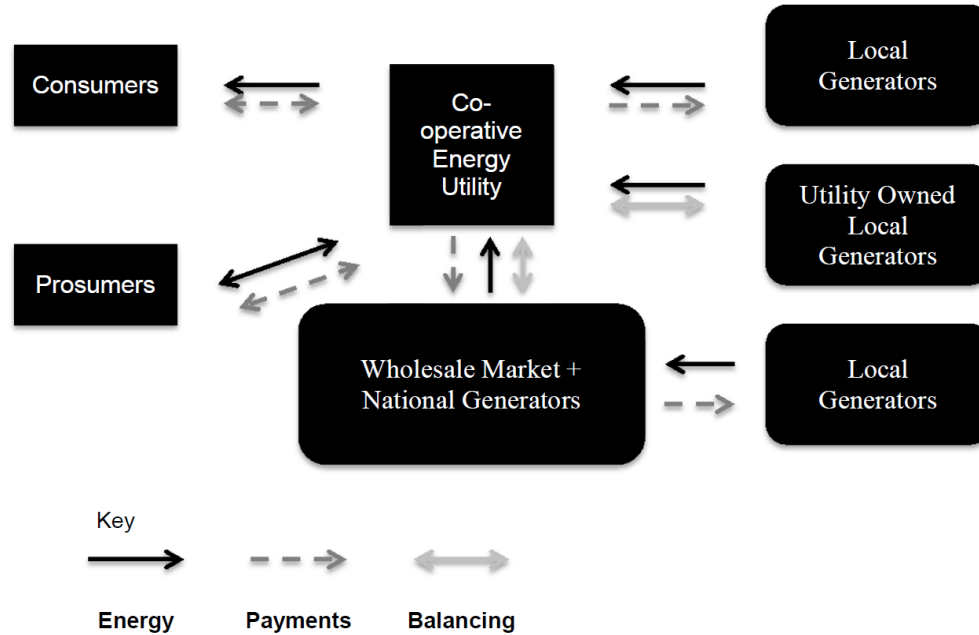


Figure 4 – The cooperative energy utility business model

Customer Segment	Typically focuses on energy supply to residential and small commercial customers
Customer Relationship	Seen as an alternative to the traditional utility, providing better customer service and fairer prices
Channels	Energy bill + customer engagement updates
Value Proposition	Provision of green/renewable electricity & gas to coop members for zero or near-zero margin, whilst supporting the local community
Key Activities	Green electricity generation, deployment of new renewable capacity, energy trading, retail sale green gas & green electricity
Key Partners	Cooperative members, energy market regulator, grid operators, energy suppliers
Key Resources	Cooperative membership base, (renewable) generation infrastructure, locally-sourced image
Cost Structure	Renewables deployment, asset operation & maintenance, customer admin, cooperative member pay-outs, staff, wholesale energy purchases, network charges
Revenue Stream	Green energy (electricity, gas, heat) sales, coop membership buy-in

Example – Energy4all

- **Energy4all is a collective organization of energy co-operatives in the UK**
 - includes 30 co-operatives with nearly 17000 members
- **Membership fees start from £250. The co-op builds or purchases a share of a generation project, providing fair return on investment for members.**



Consumer side models

- **Utilities need to develop new value propositions to maintain competitiveness in the changing energy landscape.**
 - from simple commodity suppliers to comprehensive energy solution providers.
- **Public Service Electric & Gas Company (PSE&G). New Jersey's largest utility offers a Solar Loan Program, providing financing for solar energy systems on homes, businesses and municipal buildings throughout its electric service area.**

Revenue streams

Cash

The consumer pays for and receives the solar home system (SHS), which is installed by the consumer himself or by the company. On completion, ownership is transferred to the consumer.

Credit

The consumer receives an SHS and pays regular instalments plus possibly a down payment. The loan may be provided by the company that sells the products or by a financial institution.

Leasing

The consumer is allowed to use the SHS and pays regular instalments. Initially, the company owns the system. Later, once the system is fully paid for by the consumer, the ownership is transferred.

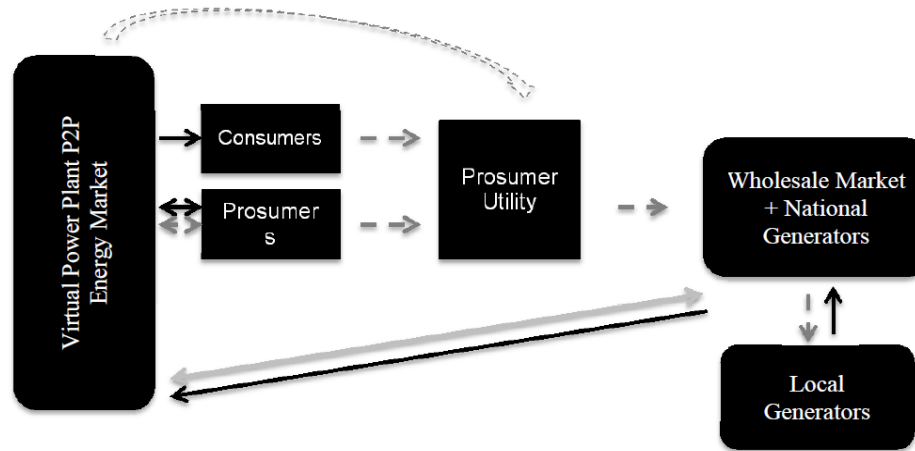
Fee-for-Service (aka esco model)

The consumer is allowed to use an SHS that is owned by the company. The consumer pays either a fixed fee for the system uptime or a variable fee depending on the kWh used (aka Power purchase agreement PPA).

Charity

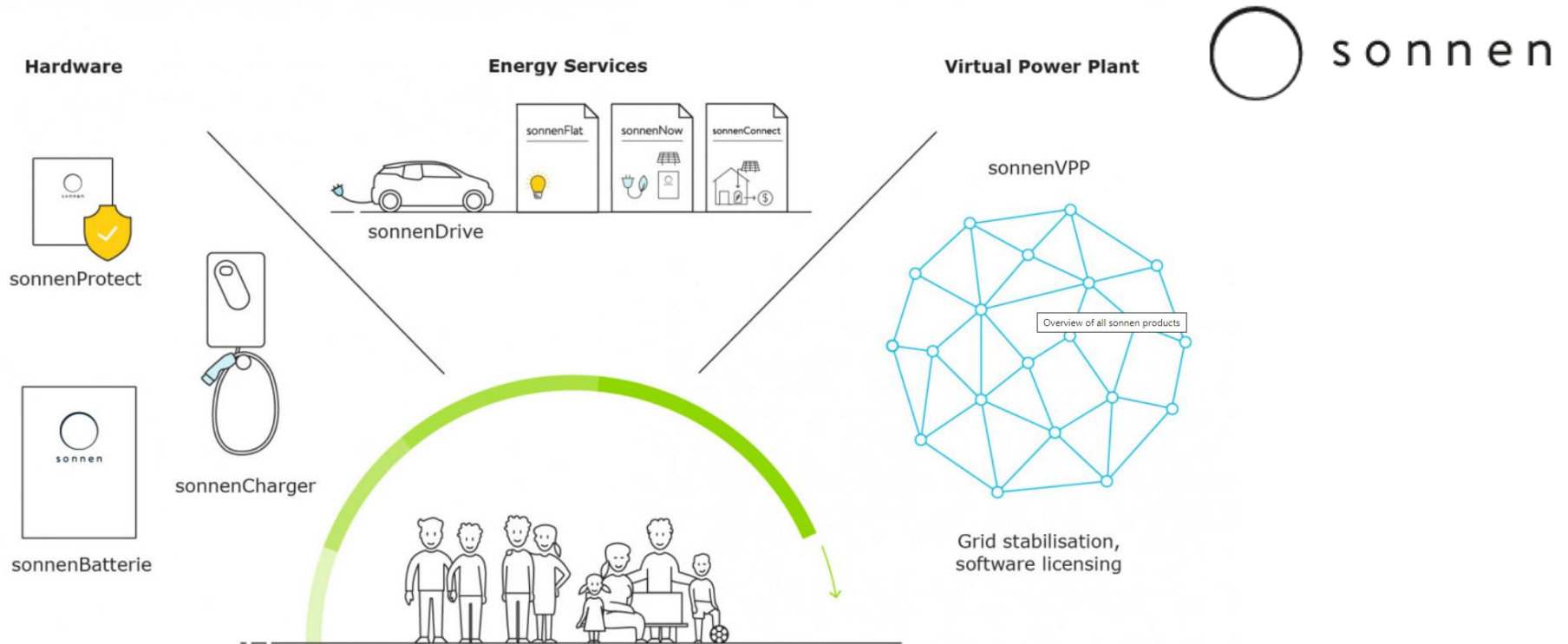
Charity organizations, utilities and energy companies providing capital to finance programmes in developing world.

Prosumer utility



Customer Segment	Typically focuses on residential customers.
Customer Relationship	Seen as a means for supporting locally-sourced green energy
Channels	Energy bill + energy community app/platform + customer engagement updates
Value Proposition	Green/local energy produced by locals for locals using customer-owned/leased products
Key Activities	Development and operation of P2P/VPP platform, signing-up prosumers into network, provision of kit (solar pv, storage)
Key Partners	"Community members" (i.e. platform customers), prosumer customers, grid operator, energy market regulator
Key Resources	Prosumer assets (e.g. residential solar pv), peer-2-peer trading platform software, consumer empowerment image
Cost Structure	Staff, peer-2-peer platform operation & maintenance, equipment installation and maintenance, R&D, network costs, customer admin
Revenue Stream	Solar pv and battery sales and leasing, peer-2-peer membership payments, energy arbitrage, energy balancing services

Example - Sonnen



Prosumer facilitator

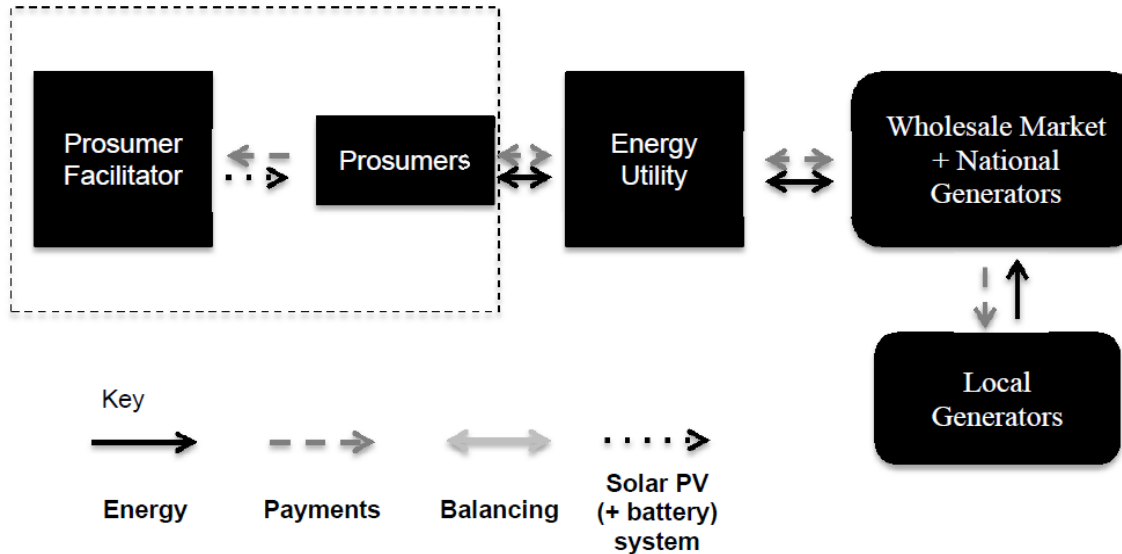


Figure 6 – The prosumer facilitator business model

Customer Segment	Typically focuses on residential and commercial customers.
Customer Relationship	Seen as a provider of energy “self-sufficiency” or of reduced dependency on the grid
Channels	Point-of-sale + any additional maintenance provision
Value Proposition	Helping customers become less-dependent/completely independent of the energy grid
Key Activities	Sale/lease of solar pv AND/OR battery storage
Key Partners	Original Equipment Manufacturers, network of equipment installers, 3 rd party retailers
Key Resources	Brand, technology expertise, equipment manufacturer and installer network
Cost Structure	Staff, equipment production and installation, marketing, technology R&D
Revenue Stream	Solar pv and battery sales, servicing and maintenance contracts

Example - Finnwind

- Finnwind operates through a dealer model, which is oldest model for micro-generation business
- Final user (prosumer) is in the center of dealer model. Ownership of the system stays with household.
- In this model investment on micro-generation requires upfront capital expenditure.
 - In developed countries households often use savings although it is important that there are credit options available.
 - Credit should be easy to access (micro-generation equipment or real estate are accepted as collateral).
 - Low interest rate for credit is crucial.



Service based models and households

- **Service based business models are increasingly used by households and communities for renewable micro-generation of energy.**
 - Lowers the barrier of installing micro-generation and provide savings for households immediately after the installation without upfront payment.
 - Easy solution to finance renewable energy
 - Leads potentially to rapid local renewable energy capacity scale-up.
- **Consequently, servicizing have an impact on possible consumer roles**



Example – Tesla (ex Solar City)

	SUBSCRIPTION	LOAN PURCHASE	CASH PURCHASE
CASH UPFRONT	None	None	Full cost due at install
LIFETIME VALUE	Good	Better	Best
SYSTEM OWNERSHIP	No	Yes	Yes
CANCEL ANYTIME	No cancellation fee	N/A	N/A
INVESTMENT TAX CREDIT	Tesla keeps tax credit to provide low subscription price	Yes Apply your tax credit to your loan to maintain monthly payment amount	Yes
MAINTENANCE	Tesla owns and maintains the system	10 year comprehensive and 25 year panel performance warranty	10 year comprehensive and 25 year panel performance warranty

Helen Designated Panels Model in Finland



- Centralized option for solar production
- Designated panels that are “leased” to consumers. Fixed fee regardless of production output.
- Utility operates the unit
- Grid utilization
- How would you characterize this business model?

Energy Service Companies (ESCO)

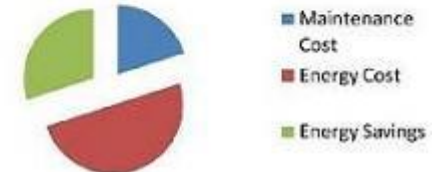


- ESCOs invest their own money in energy saving projects at clients' sites
 - ESCO finances and conducts an energy saving investment in client's premises
- Pay-back from the cost savings that the customer receives as a result of the investment
- Contract period usually 3-10 years
- USA: revenues of ESCO industry \$1.8-\$2.1 billion, annual growth 24 % during the last decade
- Estimate: revenues outside of USA \$560-620 million

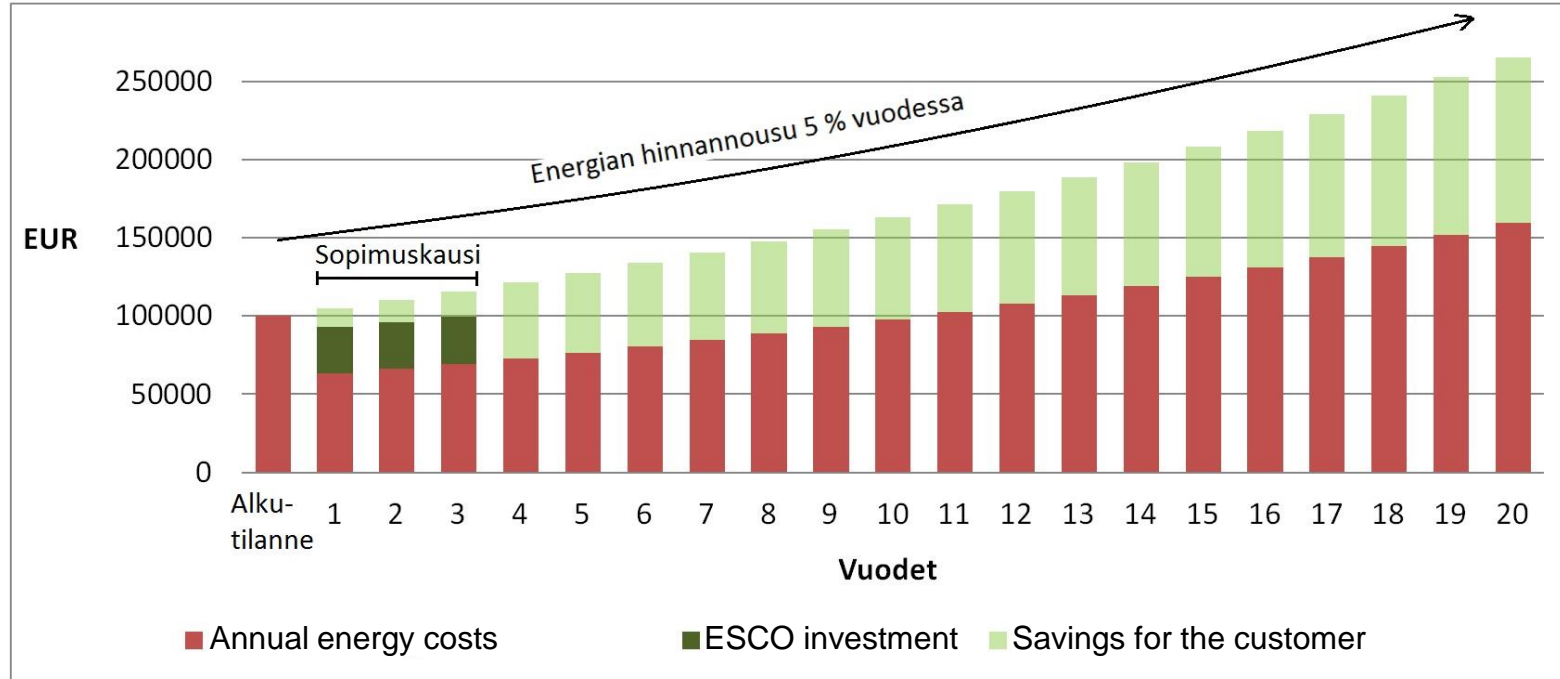
Before Project



After Project



Energy Service Companies (ESCO)



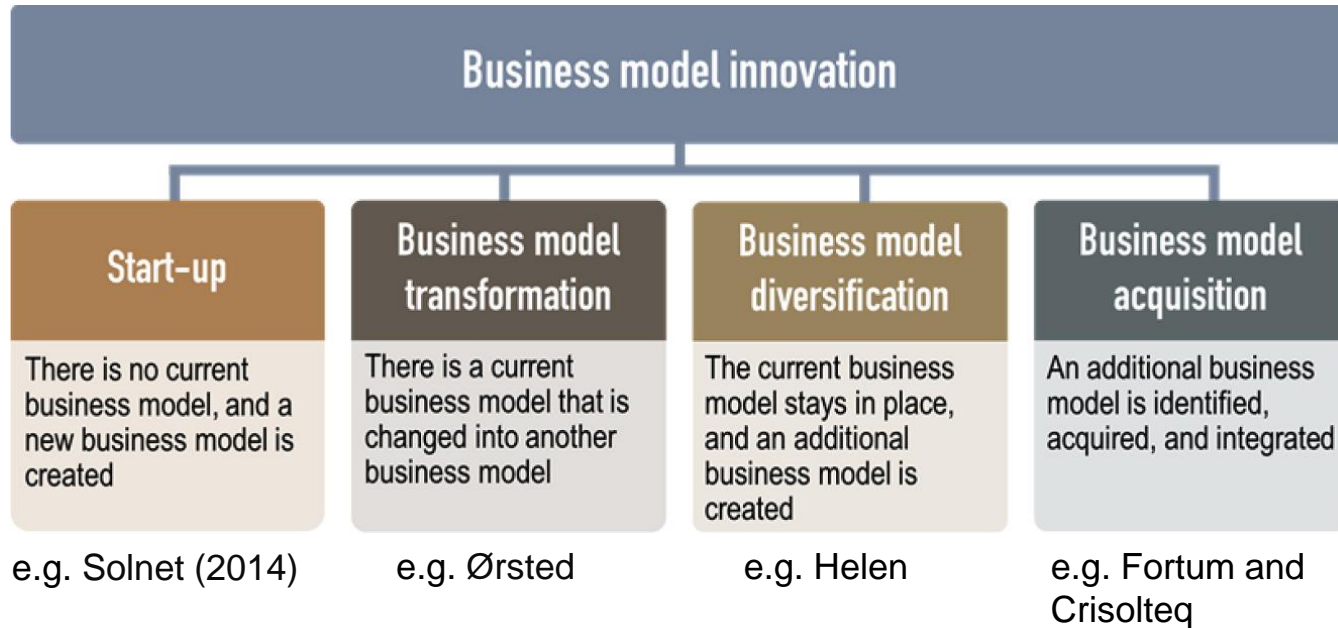
Business model innovation exercise

Business model innovation - background

Innovating business models can have higher potential returns than product or process innovations (Chesbrough, 2007)

Can lead to additional opportunities for diversification or value co-creation (Geissdoerfer et al. 2019)

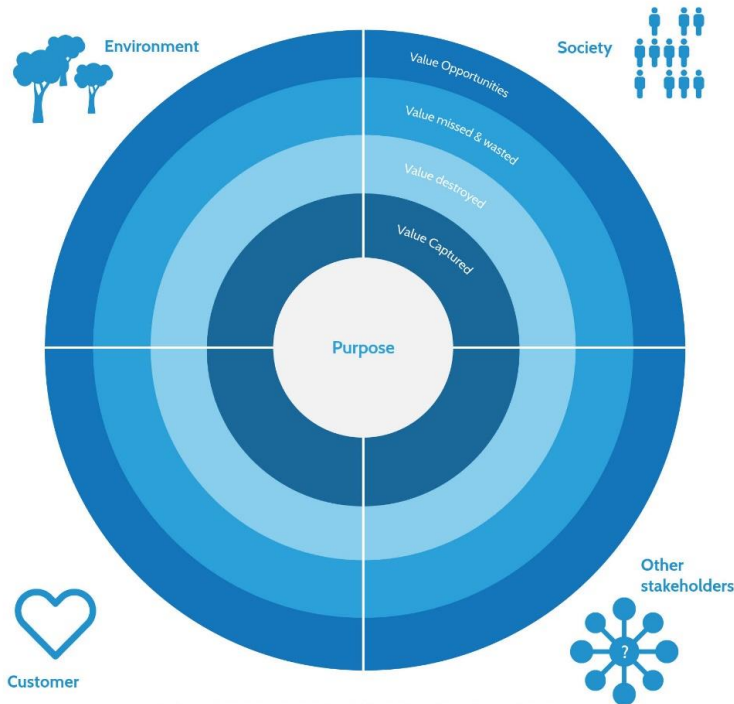
Business model innovation - background



Business model innovation – some tools

- Business model canvas
- Lean canvas
- Sustainable business model canvas
- Value mapping tool (next exercise)

Value mapping tool for sustainable business model innovation

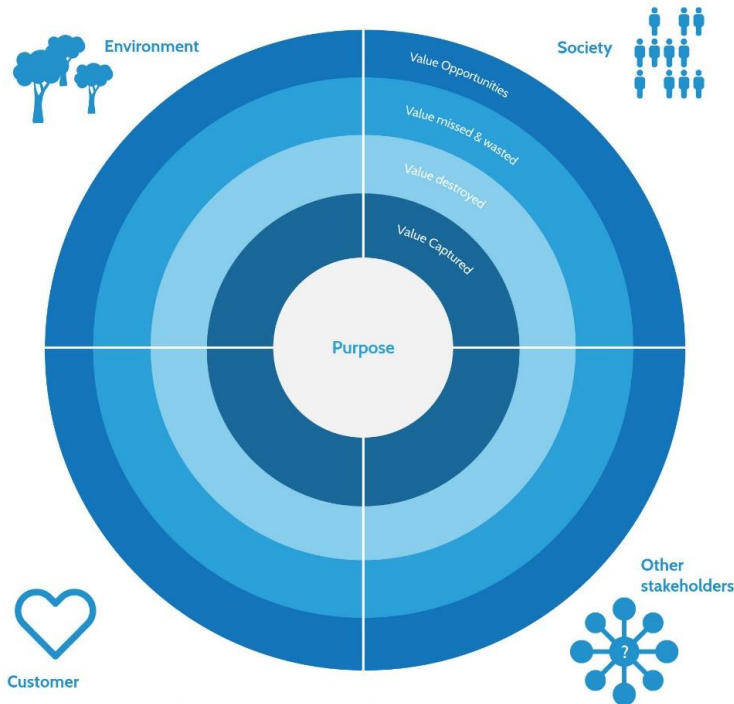


1. Consider a particular business model
2. Identify stakeholder groups for which it creates value
3. Analyze the current value created
4. Analyze value destroyed by the current model
5. Analyzed value missed or wasted by the current model
6. Identify opportunities for new value creation

Source: Henry Bocken based on Bocken, N., Short, S., Rana, P., Evans, S. 2013. A value mapping tool for sustainable business modelling. Corporate Governance 13 (5), 480–497

Bocken, N., Short, S., Rana, P., Evans, S., 2013. A value mapping tool for sustainable business modelling. Corporate Governance 13, 482–497. <https://doi.org/10.1108/CG-06-2013-0078>

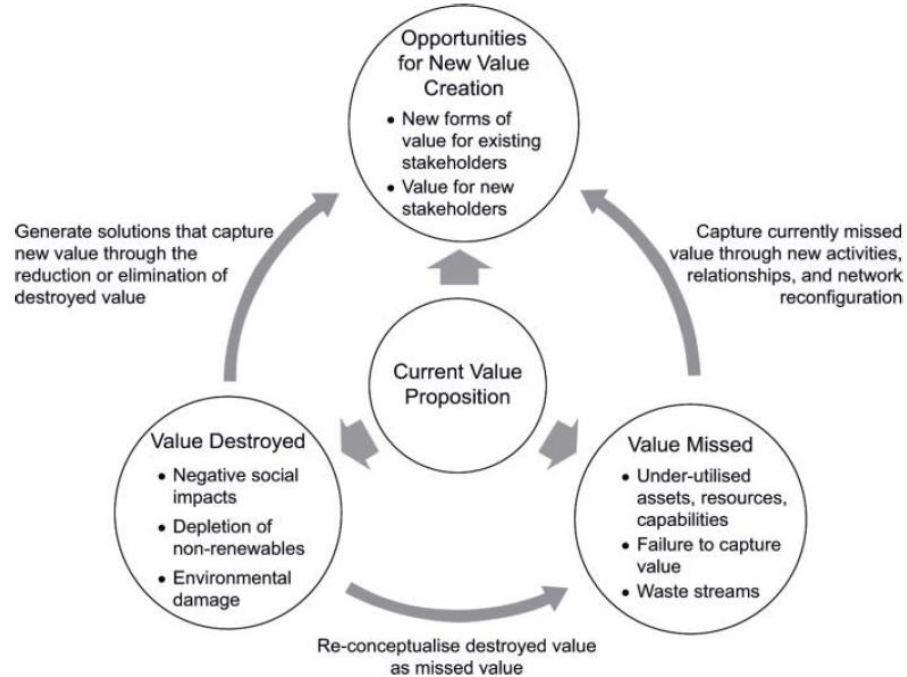
Value mapping tool for sustainable business model innovation



Source: Nancy Bocken based on Bocken, N., Short, S., Rana, P., Evans, S. 2013. A value mapping tool for sustainable business modelling. Corporate Governance, 13 (5), 480–497

1. Consider a particular business model
2. Identify stakeholder groups for which it creates value
3. **Analyze the current value created**
4. **Analyze value destroyed by the current model**
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Examples



Case business models

Groups 1-4: Generic conventional utility business model (e.g. Fortum)

Groups 5-8: Generic consumer-side business model (e.g. as described in the Richter article)

Flinga: FPZDKER

Summary

- **Business model thinking is important for business renewal – high relevance in the energy transition**
- **Renewable energy BMs include utility-side and customer-side focused models, with various types of revenue models and activities**
- **Various tools exist for business model innovation e.g. business model canvas and value mapping tool**

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