ReUseHeat

Urban waste heat recovery investment

November 14, 2018

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 768936.

The urban waste heat recovery investment

- **Barriers to stakeholders – preliminary results**
- **Important aspects of contracts – first ideas**
- **The business model – first ideas**

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Interviews with stakeholders (8 countries: SE, DK, ITA, BE, GE, RO, FR, ES)

-DH operators

-Policy makers

-Investors

-Customers

-Owners of urban waste heat

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Focus areas of the interviews

1. Technical knowledge
2. Maturity
3. Replicability potential
4. Legal framework in place
5. Permit procedure for UWHR
6. Do existing DH networks allow UWHR?
7. Incentives to other energy solutions?
8. Legionella legislation
9. Other

1. The technology is there: it is not an issue

2. Little empirical evidence
- ”how”
- ”where”

3. HIGH!

4. No legal framework in place
- Municipal legislation can hinder (Fra, Esp)

5. No standardized permit process

6. Yes but the supply temperature determines how efficient the recovery will be

7. YES! RES! And efficient CHP

8. Not an issue

9. No standardized contracts
No taxes/ incentives
Low awareness about the possibility
Heat deliveries must be guaranteed
Find a convenient (physical) place is hard
Difficult to estimate the payback
DH operators are not interested in Winter

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Important factors for efficient contracts

1	**Risk transfer components**
	Heat demand
	Price of electricity
	Other
2	**Contractual components of relevance**
	Supply
	Construction
	Operation
	Maintenance
	Pricing
	Insurance
	Mitigation and compensation
	Quality assurance
	Monitoring
	Billing
	Change of roles
	Renegotiation
	Disputes

3	**Ownership choices**
	Public
	Private
	Public-Private
4	***Input from stakeholder interviews***
	Seasonality of heat demand
	Information assymetry
	Legal & regulatory issues
	Renegotiation
	Long-term contracts

We find that standardized contracts could support the implementation…
What level of detail is needed?
What components are critical?

Next step: identify how the demosites account for this

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A comparison to industrial waste heat recovery

Important factors

- Long term contract (for payoff and stable relationship) Similar
- Continuity in the heat delivery Less important
- The value of the heat Similar
- Renegotiation clause More important
- Understanding of each other's processes Less important
- The risk of becoming dependent Less important

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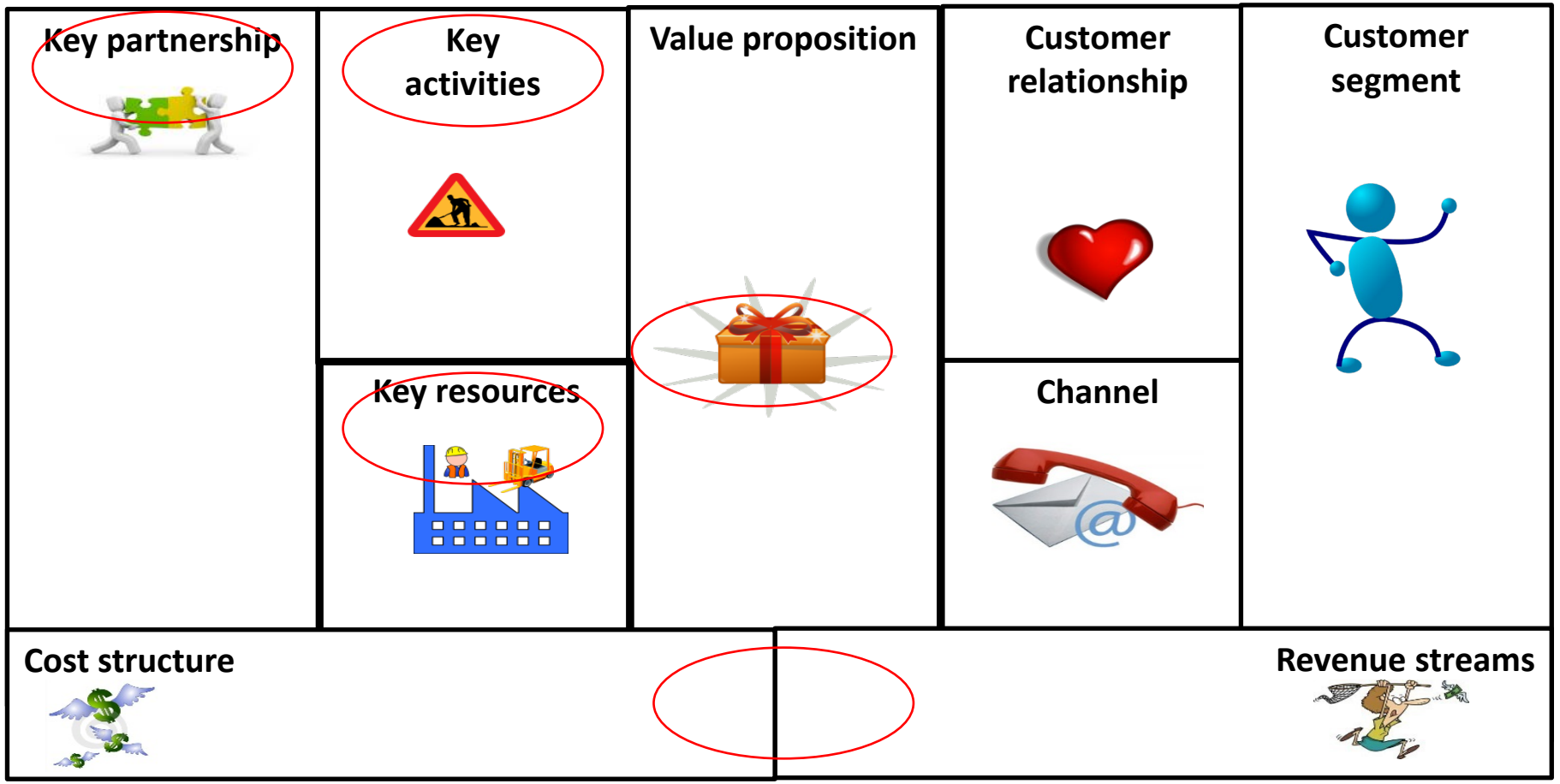
The point of departure is the conventional 3rd generation business model



GREEN has a value!

New equipment

Waste heat provider dialogue

Additional fuel provider (prosumer?)

Fuel price
Operational cost (low temp)
Ownership

Source: Ostewalder & Pigneur (2010)

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- Questions arise…
- How are the business model components impacted under different contractual models?

- When is the urban waste heat recovery most efficient to the conventional business?

- How should it be implemented? In islands? In the main network?

- Does the urban heat source need to have a safety line (from the conventional DH system)?

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