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Risk mitigation for industrial excess heat recovery projects

Panel 5 - Business models, finance and investment

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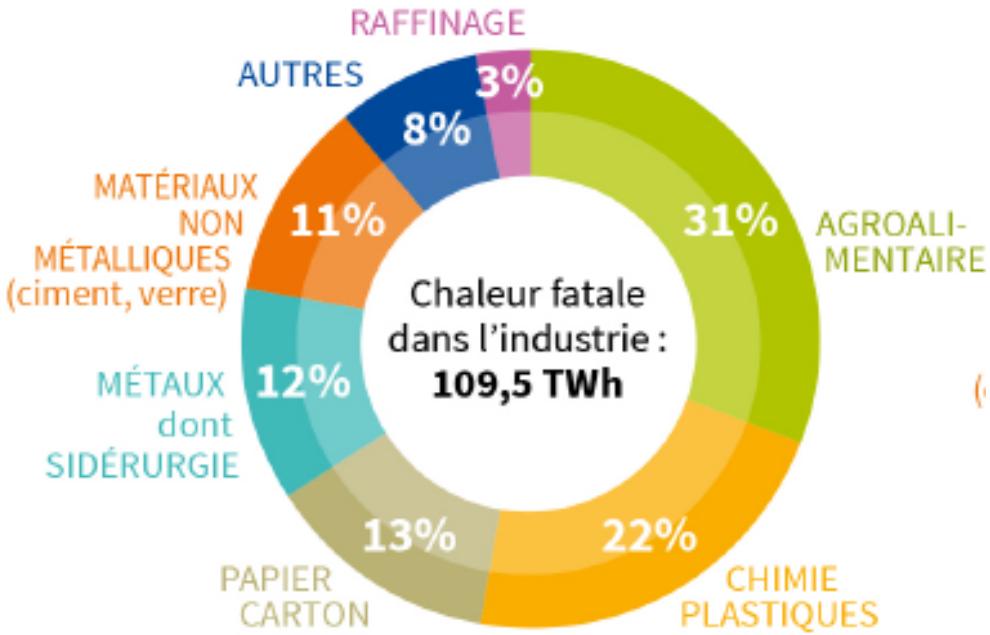
Excess heat recovery – An unused potential

- ❑ Already paid energy ;
- ❑ Large source of excess heat ;
- ❑ Energy consumption reduction ;
- ❑ Increase of EU Industry competitiveness ;
- ❑ EU Policy maker significant support.

➔ **But only a few projects succeed**



Excess heat recovery projects – Specificities

- Multiplicity of stakeholders :
  - Industry that produces the excess heat ;
  - Industry that consumes the energy ;
  - Financing organization ;
  - Local authority.
- Difficulties to find financial support ;
- Energy production is a complementary activity from the industry viewpoint.

Risks assessment – ADEME Study

Objectives

- To list standard risks ;
- To list possible causes of those risks ;
- To list existing mitigation measures and to propose new ones.

Method

Study of a large panel of very different projects, success and failures.

Obstacles categories

- **Technical** (Uncertainty on excess heat long-term availability)
- **Organizational** (Lack of agreement between stakeholders)
- **Financial / Economical** - Failure to achieve profitability :
  - fluctuation in energy market prices ;
  - fluctuation in excess heat supply or consumption…
- **Legal** (Implementation constraints)
- **Operational** (Failure to achieve targeted performance)

Risks Matrix

	Type 1 Projet 1	Type 1 Projet 2	Type 2 Projet 1	Type 2 Projet 2	Type 2 Projet 3	Type 3 Projet 1	Type 3 Projet 2	Type 3 Projet 3	Type 3 Projet 4	Type 4 Projet 1	Type 4 Projet 2
Statut	D	R	A	R	A	R	R	R	R	D	D
Risque de développement	■			■		■	■	■		■	■
Risque de disponibilité temporaire					■						
Risque de disponibilité permanente				■				■	■	■	
Risque de demande		■	■		■			■			■
Risque tarifaire	■			■	■						
Risque de commercialisation										■	■
Risque de financement			■				■				
Autres risques			■		■	■	■			■	

Current risks matrix – Part 1

Nature	Sub-category	Risque
Technical	Conception	Unadapted technology; Complex equipment or system
Operation	Operation	Unreached performance
Financial	Non-compliance on the terms	Energy prices variation
Contract	Non-compliance on the terms	Unplanned departure of a member

Current risks matrix

Mitigation (Prevention)	Mitigation (Protection)
Benchmark / Technical experts committee adapted technology	Budget uncertainties
Feedbacks / Benchmark	Contracts with performance objectives
Sensitivity analysis (Capex / Opex / Furniture / Purchase) +/- disruptiv	Assurances Contracts with penalties Indexation on energy market prices
Identify stakeholders Define risks and opportunities of different contracts types	Entry / exit clauses Renegociation clause Intellectual property Confidentiality clause Data protection

Conclusion – A tool…

Operational, used in :

- ❑ Feasibility studies :
  - ✓ *Example of Fos Harbour June 2020 : « excess heat and decarbonation strategies of the platform »*
- ❑ Training programs…

To be challenged and updated regularly in the future.

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Thank you for your attention.

Any questions ?