

Valuing and communicating the multiple benefits of energy-efficiency projects

Dr Catherine Cooremans, University of Lausanne

Dr Clemens Rohde, Fraunhofer Institute

ECEEE, Industrial Summer Study

15 September 2020

Multiple benefits of energy efficiency



Environmental Change Institute



Lucerne University of Applied Sciences and Arts

**HOCHSCHULE
LUZERN**

FH Zentralschweiz



European
Council for an
Energy Efficient
Economy



Utrecht University



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 785131. This document only reflects the authors' views and EASME is not responsible for any use that may be made of the information it contains.

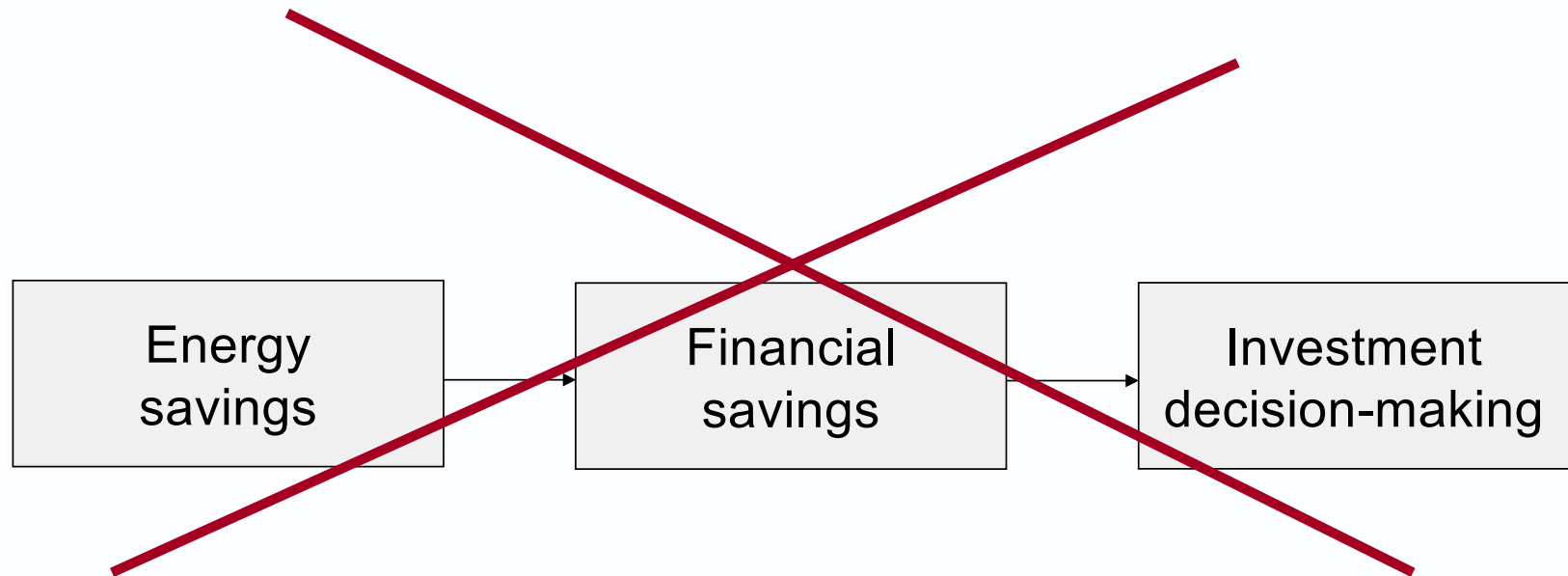
Outline

1. Context
2. Concepts and method
3. Pilot projects
4. Conclusion

1. Context

Companies waste vast amounts of energy

The classical engineering “technico-economic” approach...

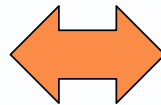


... does not work (well enough).

Two parallel business cultures and interests:

Production people care about:

- Product quality & reliability
- Safety of people & process
- Costs (all)
- Time (production, delivery, etc.)
- (Environmental impact)
- (Energy costs)



Energy people care about:

- Energy consumption
- Energy costs

Why M-Benefits ?

55% of companies rarely or never include NEBs in their investment calculations

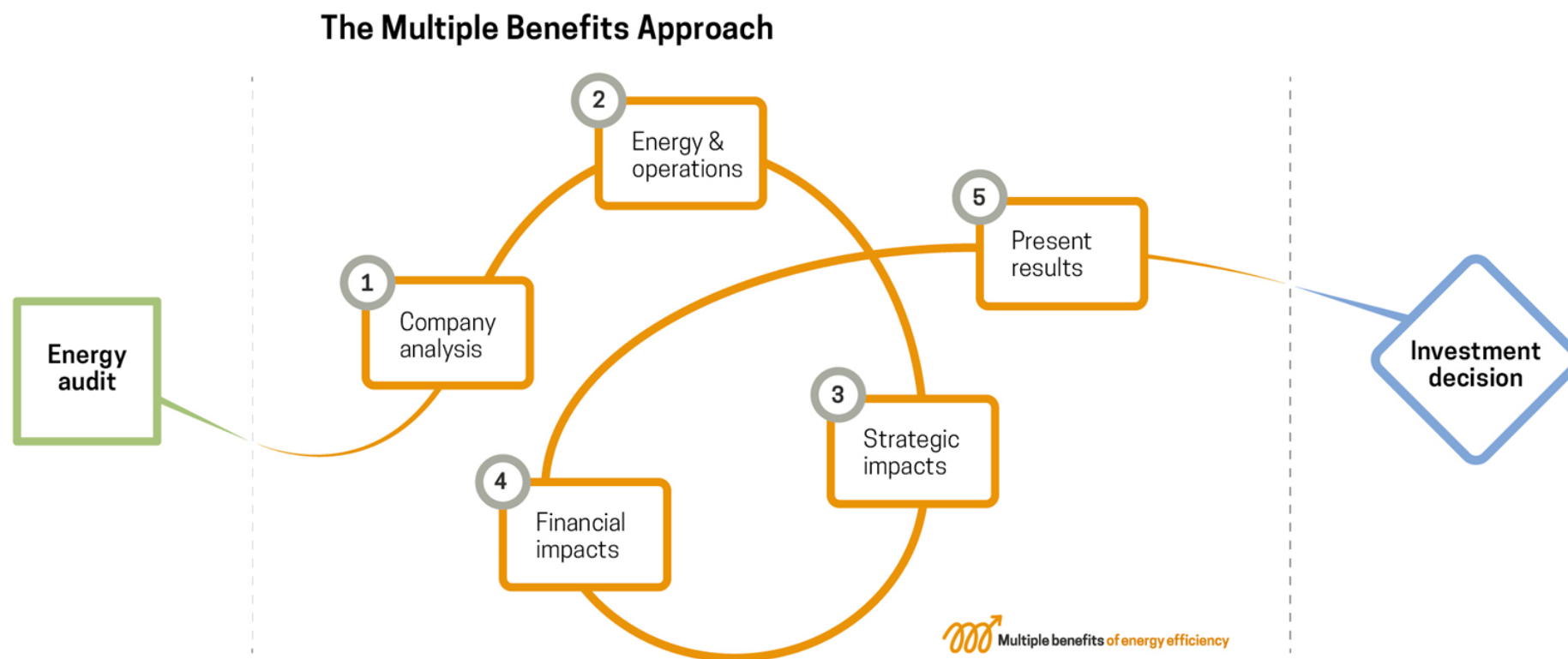
Source: M_Key – The drivers of energy-efficiency investments in Swiss large-scale energy consumers. A research project (2015-2017) of the Swiss National Science Foundation programme “Managing energy consumption” (NRP71)

<http://www.nrp71.ch/en/projects/module-2-economy-enterprises/investing-in-energy-efficiency>

Cooremans, C., Schoenenberger, A. (2019)

2. Concepts and method

to identify and value the non-energy benefits of energy-efficiency projects



STEP 1

Step 1 answers the question: what is the project's contribution to the company's **business model**?



Business model canvas, Pigneur et Osterwalder, 2010

STEP 2

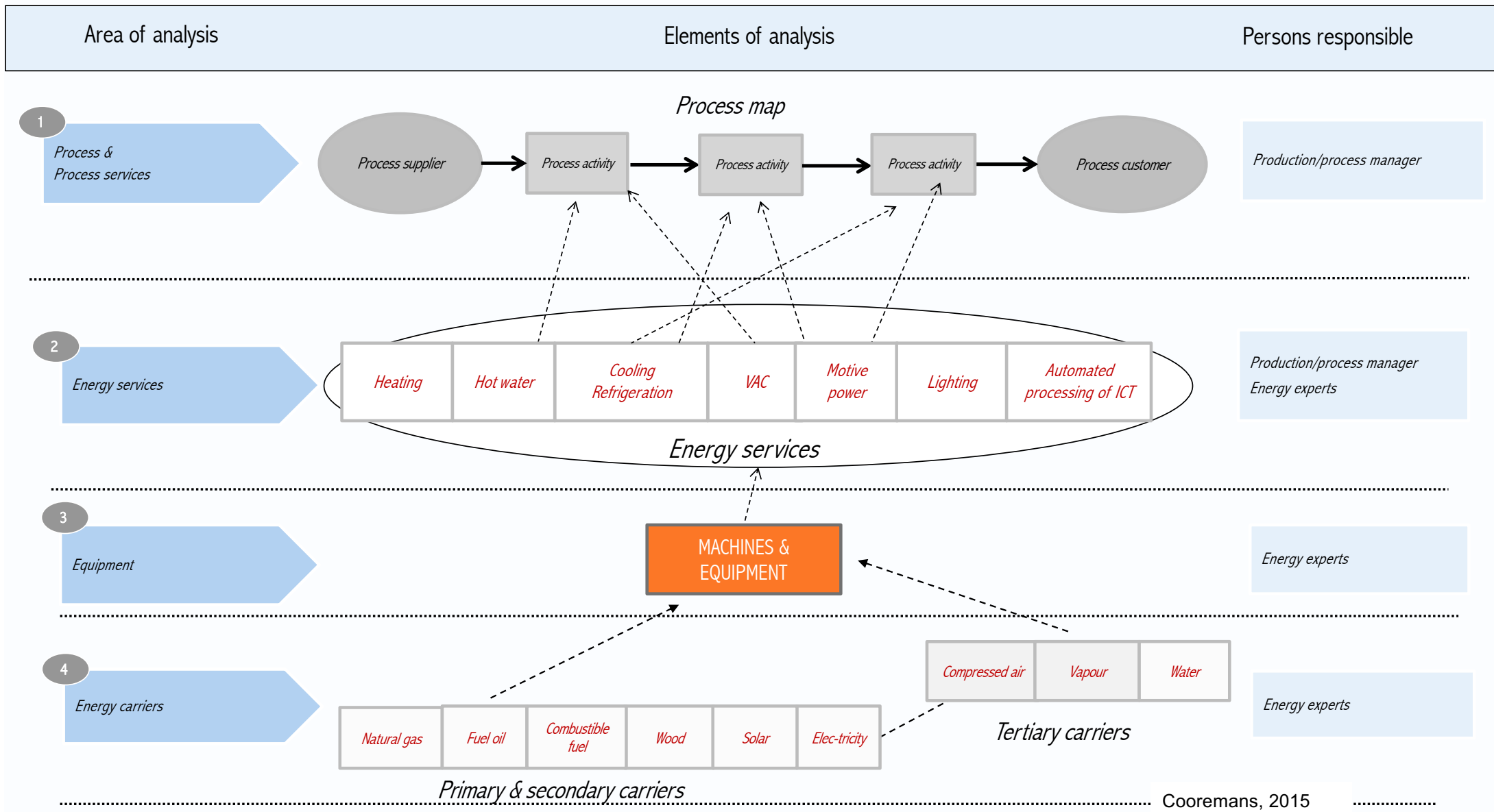
Step 2 answers the question: what is the project's contribution to **operational excellence**?

Safety

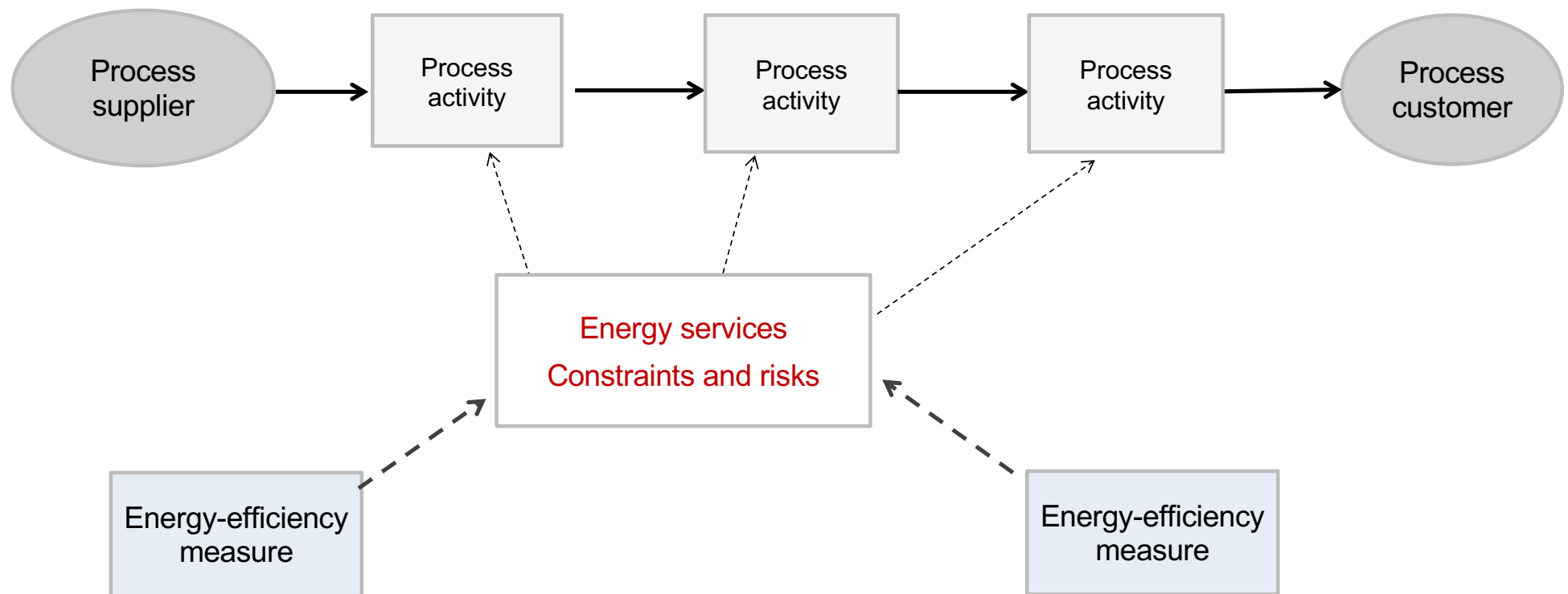
Quality

Costs

Time



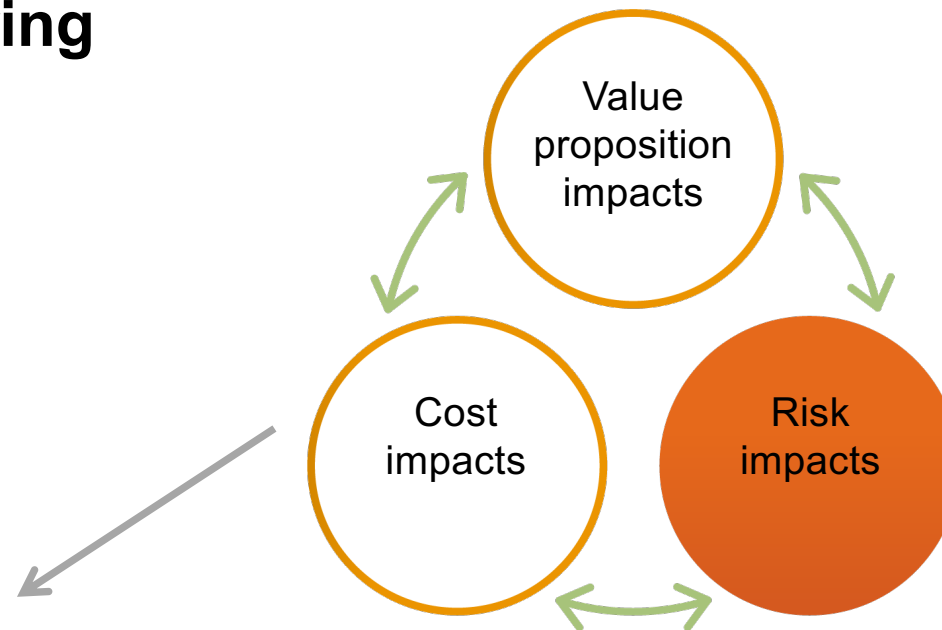
Operational analysis



STEP 3

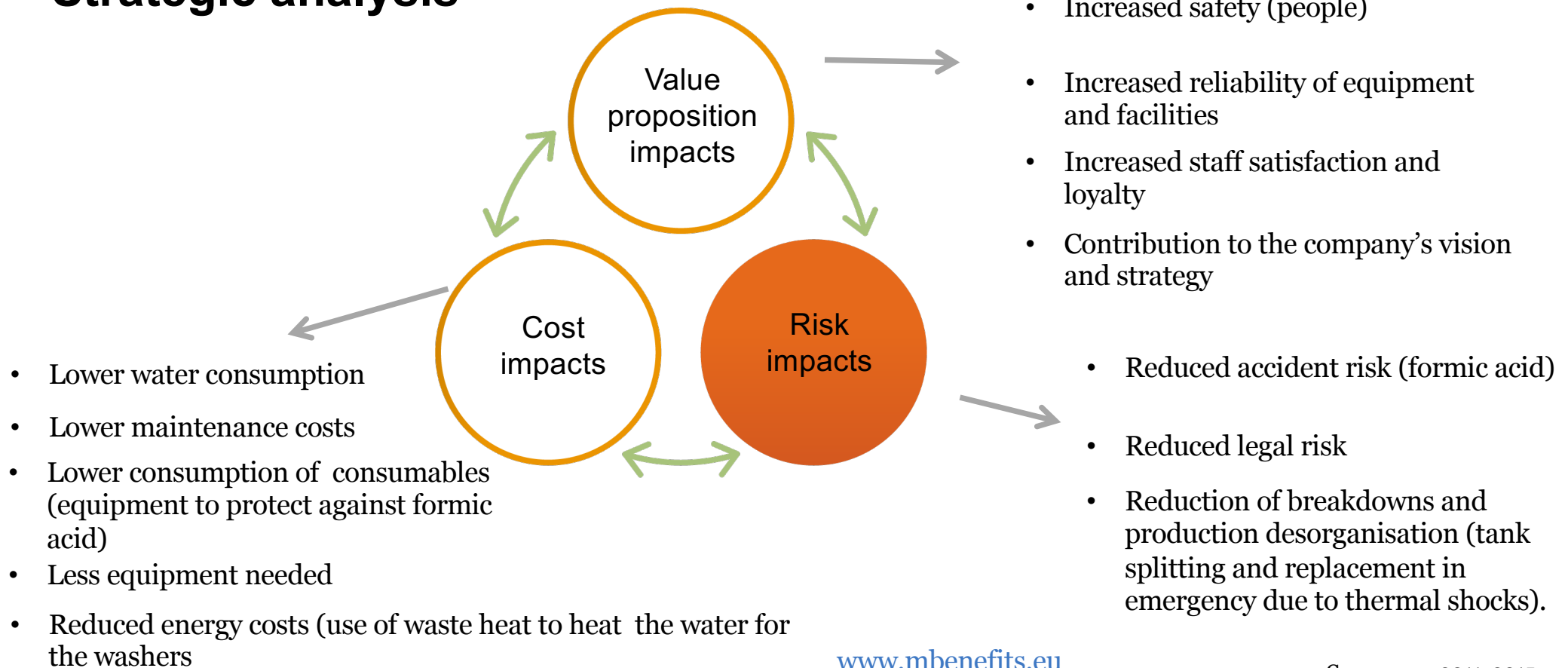
Step 3 answers the question: what is the project's contribution to the company's competitive advantage?

Conventional engineering approach



- Reduced energy costs

Strategic analysis



STEP 4

Step 4 answers the question: what is the financial **profitability** of the project?

Financial analysis

Energy benefits only:

- CAPEX: 30'000 €
- NPV: -11'483 €
- IRR: -7.5%
- Simple payback: 13 years

All benefits included:

- CAPEX: 30'000 €
- NPV: 5'898 €
- IRR: 11.5%
- Simple payback: 4.7 years

www.mbenefits.eu

Discount rate: 6 %

Investment duration: 8 years (i.e. the number of years taken into account to compute NPV and IRR)

See slides 13 & 14 for detailed calculations

STEP 5

Synthesis of steps 1-4 and communication to decision-makers: why adopt this project?

MULTIPLE BENEFITS TOOLBOX - OVERVIEW



3. Pilot projects

Testing the M-Benefits toolbox

7 Implementing partners and 34 pilot projects

- Austria: 4 pilots
 - Germany: 6 pilots
 - Italy: 5 pilots
 - Greece: 4 pilots
 - Poland: 3 pilots
 - Portugal: 3 pilots
 - Switzerland: 9 pilots
- 34 pilots
 - 32 industrial projects
2 tertiary projects
 - 33 for-profit companies
1 public administration

4. Conclusion

Non-energy benefits of energy-efficiency projects :

- positively reinforce organisations' operational excellence and strategic position.
- often significantly increase the financial attractiveness of energy-efficiency projects.
- Make energy issues core business issues.

www.mbenefits.eu

Catherine.Cooremans@unil.ch

Clemens.Rohde@isi.fraunhofer.de

4. References

- Cooremans, C., Schoenenberger, A. (2019), Energy management: a key driver of energy-efficiency investment? Journal of Cleaner Production. 230, 264-275.
<https://www.sciencedirect.com/science/article/abs/pii/S0959652619314301>
- Cooremans, C. (2015). Competitiveness benefits of energy efficiency: a conceptual framework. In Proceedings of the ECEEE 2015 Summer Study. Presqu'île de Giens, France, June 2015. 1-340-15:123-131.
- Cooremans, C. (2012). Investment in energy-efficiency: do the characteristics of investments matter? Energy Efficiency Journal, 5(4), 497-518. <https://link.springer.com/article/10.1007/s12053-012-9154-x>
- Cooremans, C. (2011). Make it strategic! Financial investment logic is not enough, Energy Efficiency Journal, 4(4), 473-492. <https://link.springer.com/article/10.1007%2Fs12053-011-9125-7/metrics>
- Killip, G., Fawcett, T., Cooremans, C., ANNEX A M-BENEFITS Work Package 2: Literature review-results, https://www.researchgate.net/publication/330222578_ANNEX_A_M-BENEFITS_Work_Package_2_Literature_review-results
- Pigneur, Y.; Osterwalder A. (2010) Business Model Generation. Wiley & Sons, Hoboken, New Jersey, USA. <https://www.strategyzer.com/canvas/business-model-canvas>