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# Calculating the Levelized Cost of Heat (LCoH) for Reference Solar Thermal Systems

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**TASK 54**

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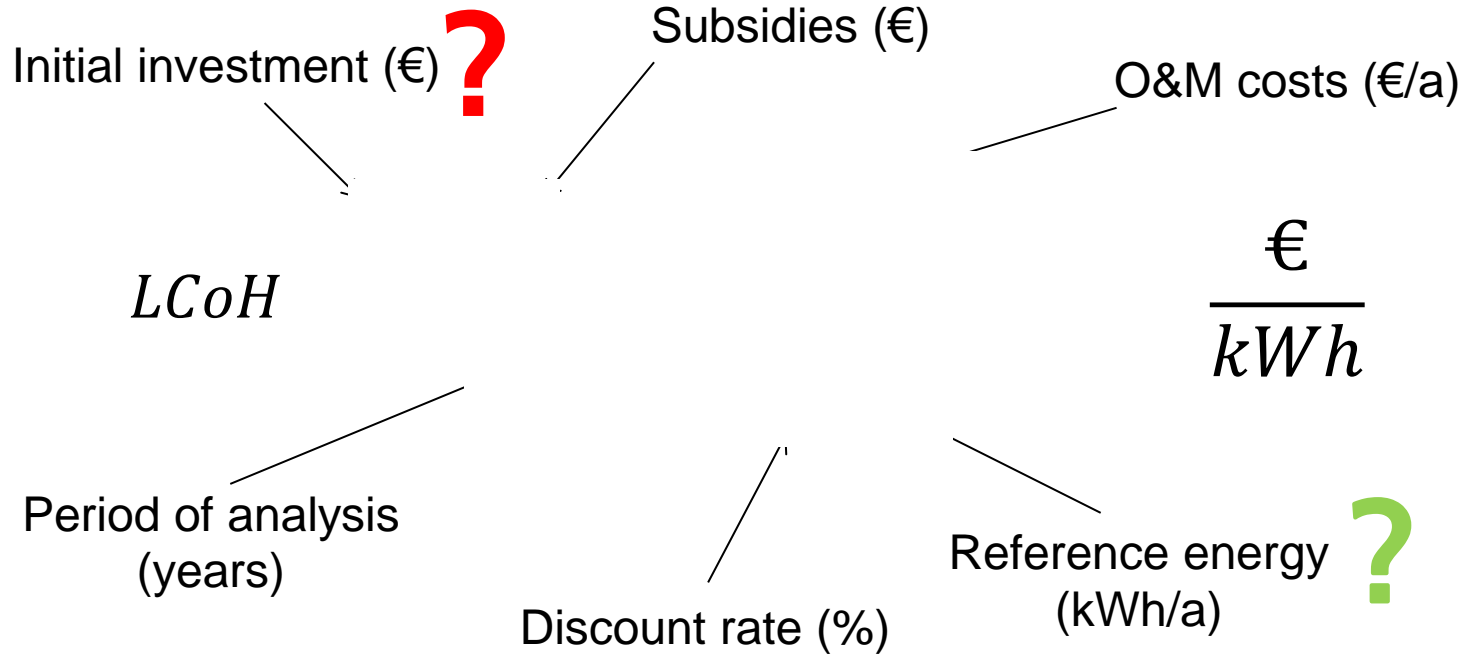
Graz, Austria

5 October 2018

# Introduction

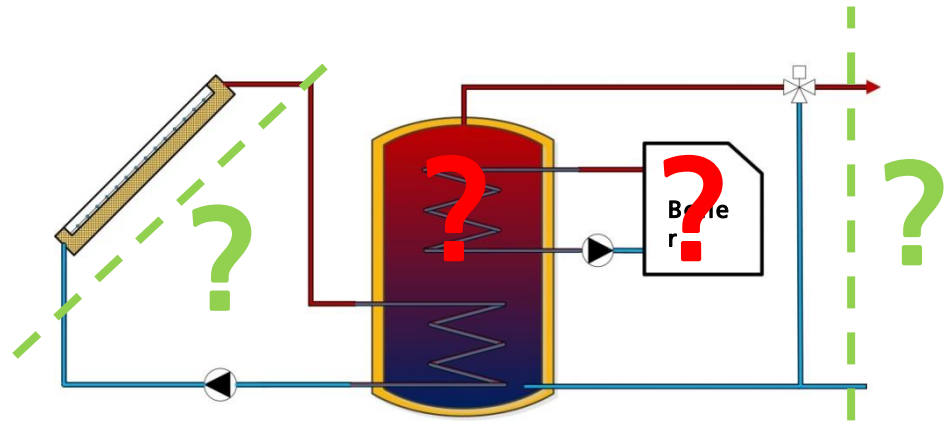
- Price reduction assessment in Task 54 requires:
  - Reference systems
  - Common **indicator** and methodology
- Levelized Cost of Heat (**LCoH**):
  - Often used in power sector (LCoE)
  - Growing usage in the heat sector
  - Assess the impact on heat costs of
    - **costs reduction** along the value chain (production to decommissioning)
    - system **performance improvements**

# LCoH Equation

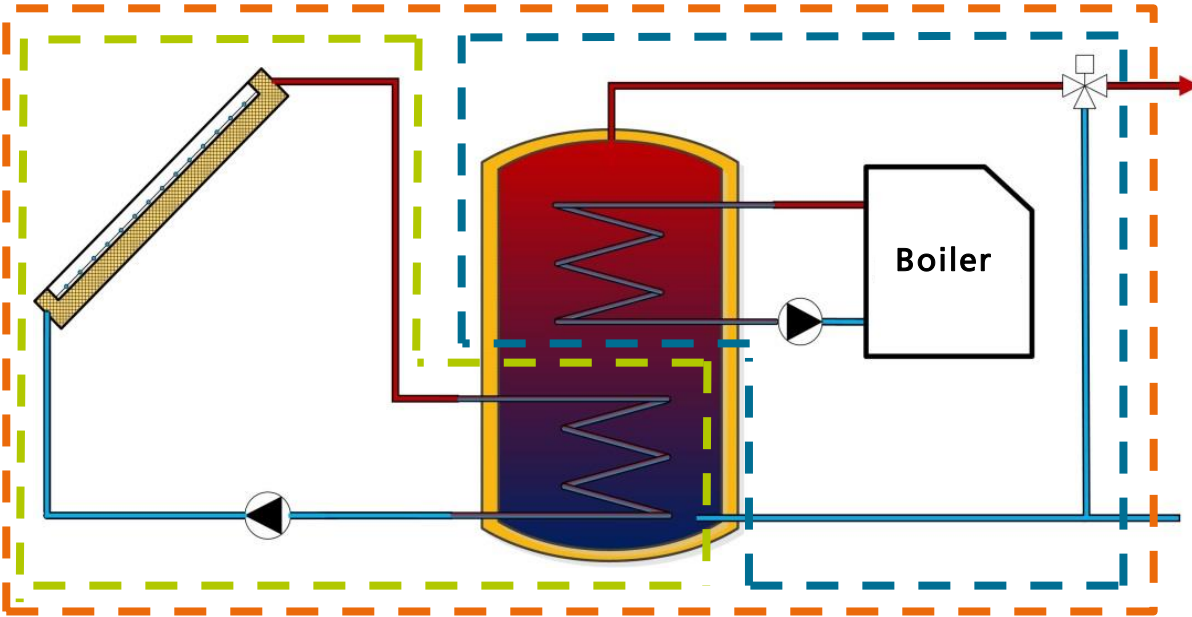


## ■ Task 54:

- $r = 0$
- $S_0 = 0$
- All costs excluding VAT



# System Boundaries and LCoH



$LCoH_{ov,fin}$  (overall)

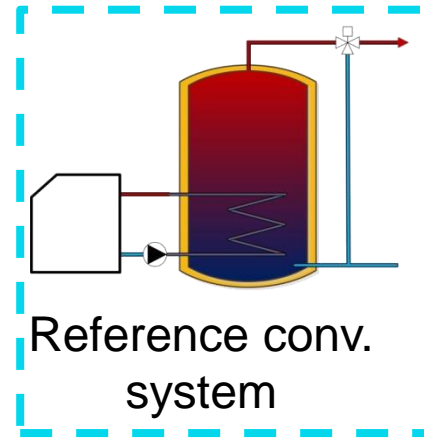
$LCoH_{sol,fin}$  (solar)

$LCoH_{conv,fin}$  (conventional)

$LCoH_{sol,fin}$

$I_0$  Overall –  
Reference conv. System

$E_t$  fin. energy „ref. conv. sys.“ –  
fin. energy „conventional“



Reference conv.  
system

# Example: Reference SDHW System in Germany (SFH)

- 5 m<sup>2</sup> FPC (gross), 300 l store, back-up: gas condensing boiler
- Saved final energy by solar: 2.2 MWh/a
- Final energy „conventional“: 13.4 MWh/a
- T = 25 years

	Conventional	Solar
Investment $I_0$ [€]	6500	3850
O&M $C_t$ [€/a]	1368	97

LCoH <sub>sol,fin</sub>	11.3 €ct/kWh
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$$LCoH = \frac{I_0 + \sum_{t=1}^T C_t}{\sum_{t=1}^T E_t}$$

# Summary

- LCoH depends on **system boundaries**  
(solar, conventional, overall)
- Several **reference energies** possible:
  - solar collector yield
  - useful solar heat
  - final energy (Task 54)
  - heat demand

Clear indexes defined  
(LCoH<sub>xx,xx</sub>)

- LCoH is a sensitive indicator: detailed assumptions necessary!
- 11 **reference systems** (5 countries) calculated in Task 54

# Thank you for your attention!

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More on Task 54:

<http://task54.iea-shc.org>



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