
Impact of the Improvements Developed during IEA SHC Task 54 on the Levelised Cost of Heat ($\text{LCoH}_{\text{sol,fin}}$)

TASK 54

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Agenda

- $LCoH_{sol,fin}$ formular used in Task 54
- Showing impact of different measures on the $LCoH_{sol,fin}$
- Impacts of performance improvements
- Combining different approaches to increase cost reduction
- Conclusions

LCoH_{sol,fin} Equation IEA SHC Task 54

Initial investment (€)

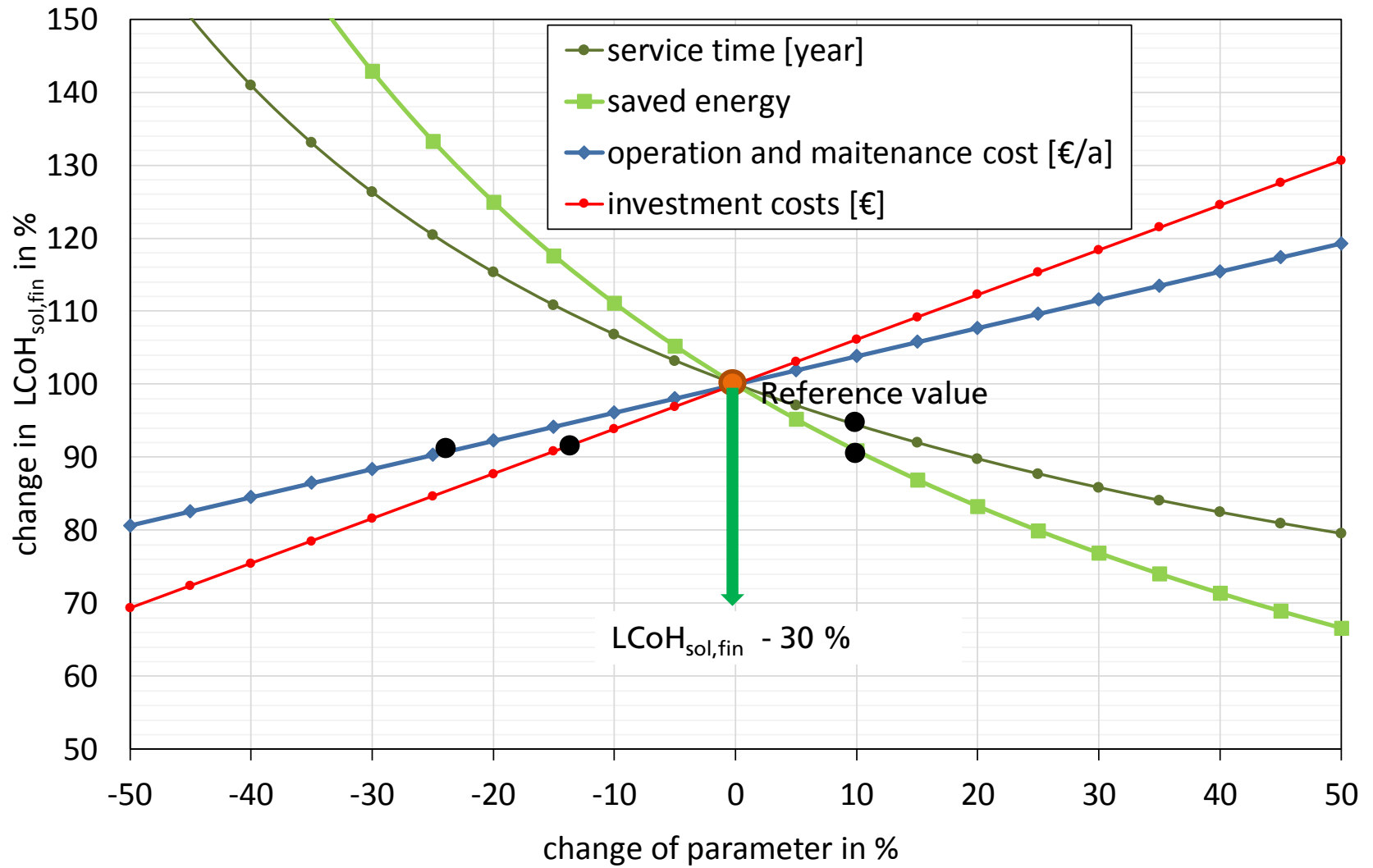
O&M costs (€/a)

$$LCoH_{sol,fin} = \frac{I_0 + \sum_{t=1}^T C_t}{\sum_{t=1}^T E_t} \frac{\text{€}}{\text{kWh}}$$

Period of analysis
(years)

Saved final energy
(kWh/a)

LCoH_{sol,fin} impacts based on SDHW System GER



Case Study 1: Collectors with overheating protection

Cost reduction potential heatpipes-systems

Levelized Cost of Heat (LCoH) – SDHW System

$LCOH_{sol,fin}$ Reference System (without VAT)	0.113 €/kWh
$LCOH_{sol,fin}$ Heat pipe system (without VAT)	0.081 – 0.093 €/kWh
Cost reduction potential für solar heat	18 - 28%

Case Study 2: Standardization

Cost reduction potential for SDHW systems

Levelized Cost of Heat (LCOH) – SDHW System

$LCOH_{sol,fin}$ Reference System (without VAT)	0.113 €/kWh
$LCOH_{sol,fin}$ "standardised" system (without VAT)	0.080 €/kWh
Cost reduction potential für solar heat	29%

Improved System performance – more saved energy

Example SDHW System GER

Reference system/ changes	Initial investment [%]	f_{sav} [%]	saved fuel [kWh/a]	$LCoH_{sol,fin}$ [%]
Reference system	100	40	2226	100
Micro circulation inhibitor	101	42	2337	96
Storage efficiency label „B“	104	45,7	2539	91
more efficient collector	103	45,1	2508	90
Storage efficiency label „B“ + more efficient collector	107	50,7	2818	82
Storage efficiency label „B“ + more efficient collector + micro circulation inhibitor	110	50,7	2889	80

Combining measures

Performance
increase

Overheating
protection

Standardisation

- Micro circulation inhibitor
- Heat storage efficiency class B
- More efficient collector
- High efficiency pump

Combining measures

Example SDHW system Germany

	Reference System	Performance increase
Investment system components [€]	2600	3055
Investment installation [€]	1250	1250
Maintenance costs [€/a]	77	77
Operation costs [€/a]	20	10
Saved final energy [kWh/a]	2226	2889
service life time [a]	25	25

Combining measures

Example SDHW system Germany

	Reference System	Performance increase	Overheating protection
Investment system components [€]	2600	3055	2695
Investment installation [€]	1250	1250	1100
Maintenance costs [€/a]	77	77	47
Operation costs [€/a]	20	10	10
Saved final energy [kWh/a]	2226	2889	2889
service life time [a]	25	25	25

Combining measures

Example SDHW system Germany

	Reference System	Performance increase	Overheating protection	Standardisation
Investment system components [€]	2600	3055	2695	2426
Investment installation [€]	1250	1250	1100	990
Maintenance costs [€/a]	77	77	47	42
Operation costs [€/a]	20	10	10	10
Saved final energy [kWh/a]	2226	2889	2889	3033
service life time [a]	25	25	25	27.5

Combining measures

Example SDHW system Germany

	Reference System	Performance increase	Overheating protection	Standardisation	Change
Investment system components [€]	2600	3055	2695	2426	-11%
Investment installation [€]	1250	1250	1100	990	
Maintenance costs [€/a]	77	77	47	42	-55%
Operation costs [€/a]	20	10	10	10	-50%
Saved final energy [kWh/a]	2226	2889	2889	3033	+36%
service life time [a]	25	25	25	27.5	+10%

Combining measures

Example SDHW system Germany

Levelized Cost of Heat ($LCOH_{sol,fin}$) – SDHW System

$LCOH_{sol,fin}$ Reference System (without VAT)	0.113 €/kWh
$LCOH_{sol,fin}$ Heat pipe system (without VAT)	0.059 €/kWh
Cost reduction potential für solar heat	48%

Combining measures

Example SDHW system Germany

Levelized Cost of Heat ($\text{LCOH}_{\text{ov,fin}}$) – SDHW System

$\text{LCOH}_{\text{ov,fin}}$ Reference System (without VAT)	0.113 €/kWh
$\text{LCOH}_{\text{ov,fin}}$ "Combined" system (without VAT)	0.110 €/kWh
Cost reduction for solar assisted SDHW	-3%

Conclusion

- Reference systems available as benchmarks
- $LCoH_{sol,fin}$ calculation procedure available to compare different approaches/systems
- Higher investment costs might save money in the long run
- Different approaches for significant solar heat cost reduction available
- Combination of different measures enhances cost reduction
- Cheaper solutions as conventional system possible

Possibilities are there!

Let's do it!

Thank you for your attention!

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More on Task 54:

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

 https://twitter.com/iea_shc_task54

Task 54 activities

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



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Price Reduction of Solar Thermal Systems

TASK 54

Task 54's aim is the purchase price reduction of installed solar thermal systems up to 40%. Our projects investigate the complete value chain:

- We evaluate and develop sustainable means to reduce production costs on material, component and system level.
- We identify and reduce post-production cost drivers, e.g. channels of distribution, marketing, installation, O&M.
- We evaluate cost-structures of manufacturers and their cost reduction potential.
- We study socio-political boundary conditions and their effect on solar thermal prices.
- We make solar thermal more attractive by improved marketing and consumer-oriented design.

Latest News / Meetings / Publications

What's New

NEWS	MEETINGS	PUBLICATIONS
<p>Final Experts Meeting 19-20 Sep 2018 - We're looking forward to our final experts meeting from 19-20 Sep 2018 in Oslo, Norway. More info will be provided on our events section soon. (Posted: 2018-07-31)</p> <p>Q&As from Task 54's Solar Academy webinar available now - Questions asked by the participants, answered by Task 54 experts. (Posted: 2018-05-15)</p> <p>IEA SHC Webinar: Cost reduction potential above 30 % - The key takeaway from an IEA SHC Solar Academy webinar held on 14 March 2018: There is still much room for cost cuts along the entire solar thermal value chain. (Posted: 2018-04-05)</p>		

SHC Task 54

Price Reduction of Solar Thermal Systems



Task Information

DURATION

October 2015 — October 2018

OPERATING AGENT

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Don't miss our final presentation at this year's @EuroSun2018 at @hsr_rapperswil. For more info on technical tours and side events have a look at the latest newsletter bit.ly/2wz3xh



Aug 27, 2018

Info Sheets

Twitter

Final Task54 Meeting in September 19, 2018

Publications