

---

# Library of References on Solar Combisystems

---

**A Report of IEA SHC - Task 26  
Solar Combisystems  
December 2002**

Peter Kovács



# **Library of References on Solar Combisystems**

by  
Peter Kovács\*

A technical report of Subtask A

\*SP  
Swedish National Testing and Research Institute  
P.O Box 857  
501 15 Borås  
SWEDEN

## Contents

### **LIBRARY OF REFERENCES ON SOLAR COMBISYSTEMS 4**

<b>1.1</b>	<b>Background</b>	<b>4</b>
<b>1.2</b>	<b>Aim</b>	<b>4</b>
<b>1.3</b>	<b>Contents of the reference library</b>	<b>4</b>
<b>1.4</b>	<b>The reference library software</b>	<b>13</b>
<b>1.5</b>	<b>Documents for download</b>	<b>13</b>

# 1 Library of References on Solar Combisystems

This report describes the compilation and contents of a literature reference library on the topic Solar Combisystems. The references were gathered from the participants of IEA SH&C Task 26 and entered into a data base using the End Note software. The data base can be downloaded from [ftp://ftp.sp.se/public/solarcombisystems\\_references](ftp://ftp.sp.se/public/solarcombisystems_references) either as an End Note file (\*.enl) or as a HTML or RTF file.

## 1.1 Background

During the course of IEA SH&C Task 26 a comparatively large number of experts in this field have been working together. The amount of accumulated knowledge is extensive and the essence of it has hopefully been made available through the different deliverables from the project. Nevertheless, there are huge amounts of background material available to those interested, some of it surely adding interesting information to the outcome of Task 26. But left without guidance, the uninitiated knowledge seeker will have difficulties to find the relevant parts. That is where this report is intended to assist. Here, the researchers of Task 26 have accumulated a list of references that can be of interest when studying solar combisystems. The references have been structured in a small data base using a reference library software, also featuring online searching, reference database management and bibliography-making.

## 1.2 Aim

The aim of this work is to support future scientific work within this field by compiling relevant references and structuring them in a data base. Hopefully, future work will also be integrated in the database. The latter will only be really efficient if it's arranged in a similar manner as here, with an organisation or a research project hosting the database and a responsible person maintaining it. However, anyone interested can of course continue to develop his or her own database, starting from here.

## 1.3 Contents of the reference library

In all, the library now contains 81 references. The references are categorized in reference types: Books, conference proceedings, reports, journal articles and magazine articles. For each reference some basic information is available: Name of author(s), print year, english title, original title, number of pages, keywords, a short abstract (in most cases) and finally information about where the publication is available. In table 1 below, all references are listed, sorted by author and in table 2 the same references are sorted by year of publication.

*Table 1: Contents of the reference library sorted by Author*

Author/ Editor Name	Reference Title	Year of publication
	Solare Raumheizungsanlagen	1995
	Tagung Solare Raumheizung	1996
	Tagung Solare Raumheizung 1997	1997
	Tagung Solare Raumheizung 1998	1998
	Tagung Solare Raumheizung 1999	1999
	Solare Raumheizungsanlagen	2000
	Tagung Solare Raumheizung 2000	2000
	Tagung Solare Raumheizung 2001	2001
Andersen, N.	Solvarmeanlæg til rumopvarmning og varmt brugsvand. Demonstrationsanlægget i Ejby	1988
Bales, C.	Evaluation of the Performance of Solar Combistores - Comparison of Three Test Methods	2000
Bales, C.	Thermal Store Testing Evaluation of Test Methods	2002
Bergmeijer, P. and A. de Geus	Evaluation of the Dutch Second Generation Solar Heating Systems	1988
Bony, J., et al.	Optimisation of Combisystems	2001
Boye-Hansen, L. and S. Furbo	Solvarmeanlæg med tømning	1995
Dahm, J., et al.	Evaluation of storage configurations with internal heat exchangers	1998
Drück, H. and E. Hahne	Thermal Testing of Stores for Solar Domestic Hot Water Systems	1996
Drück, H. and E. Hahne	Test and Comparison of Hot Water Stores for Solar Combisystems	1998
Duffie, J.A. and W.A. Beckman	Solar Engineering of Thermal Processes	1991
Eder, M., et al.	Heizen mit der Sonne - Handbuch zur Planung und Ausführung von solaren Heizungssystemen für Einfamilienhäuser	1997
Ellehaug, K.	Combined Solar Heating Systems for Domestic Hot Water and Space Heating	1992
Ellehaug, K.	Målinger på solvarmeanlæg til kombineret brugsvands- og rumopvarmning. 5 markedsførte solvarmeanlæg installeret hos anlægsejerne	1993
Ellehaug, K.	Målinger på solvarmeanlæg til sommerhus i Gilleleje. Et solvarmeanlæg til kombineret opvarmning af brugsvand, gulvvarme, svømmebassin m.m	1993
Ellehaug, K.	Monitoring of Solar Heating Systems Marketed in Denmark	1993
Ellehaug, K., T. Kildemoes, and H.J. Jacobsen	Aktive solvarmeanlæg med større dækning af husets samlede varmebehov - udredning og skitseprojekter.	1999

<b>Author/ Editor Name</b>	<b>Reference Title</b>	<b>Year of publication</b>
Ellehaug, K., L.L. Overgaard, and A. Sæbye	Solvarmeanlæg til kombineret brugsvands- og rumopvarmning. Udvikling af konkurrencedygtige anlæg. Beregninger samt forsøgsanlæg.	1991
Ellehaug, K., L.L. Overgaard, and A. Sæbye	Erfaringer fra målinger på kombinerede solvarme- og biobrændselsanlæg	2000
Ellehaug, K. and L.J. Shah	Solar Combisystems in Denmark - The Most Common System Designs	2000
Fink, C., Purkarthofer, P., Weiss, W	Systemkonzepte für solare Kombianlagen von Mehrfamilienwohnbauten und Ergebnisse aus Langzeitmessungen	2001
Hausner, R. and C. Fink	Stagnation behaviour of thermal solar systems	2000
Henden, L., J. Rekstad, and M. Meir	Thermal performance of combined solar systems with different collector efficiencies	2002
Jaboyedoff, P.	Elaboration et validation d'un programme de simulation dynamique d'une installation solaire à production combinée d'eau chaude sanitaire et chauffage.	1989
Jaboyedoff, P.	Installations solaires compactes de production combinée d'eau chaude sanitaire et chauffage -- Etude paramétrique, règles pratiques de dimensionnement.	1989
Jaboyedoff, P.	Installations solaires de production combinée d'eau chaude sanitaire et chauffage à injection directe Modélisation, validation.	1990
Jaboyedoff, P.	Installations solaires de production combinée d'eau chaude sanitaire et chauffage à injection directe -- Analyse paramétrique.	1990
Jaboyedoff, P.	Installations solaires combinées de production d'eau chaude sanitaire et de chauffage -- Planification, synthèse.	1990
Jaboyedoff, P.	Kombinierte Solaranlagen zur Wassererwärmung und Raumheizung - Synthese, Planungsempfehlungen. Research Project 'Praxisgerechte Regeln zur optimalen Planung und Ausführung von Sonnenenergieanlagen	1990
Johannesson, K. and J. Persson	Tillförlitlighetsanalys på solvärmda kombisystem. En metodik och en modell	2001
Jordan, U.	Untersuchung eines Solarspeichers zur kombinierten Trinkwassererwärmung und Heizungsunterstützung	2002
Jordan, U. and K. Vajen	Einfluss verschiedener Beladeeinrichtungen auf den Ertrag eines Kombisystems	2002
<b>Author/ Editor Name</b>	<b>Reference Title</b>	<b>Year of publication</b>

Jordan, U. and K. Vajen	Influence of the DHW profile on the Fractional Energy Savings - A Case Study of a Solar Combisystem	2002
Kovács, P. and U. Pettersson	Solvärmda kombisystem. En jämförelse mellan vakuumrör och plan solfångare genom mätning och simulering	2002
Kovacs, P. and M. Sandberg	Results from Testing of Small Heat Stores for Domestic Hot Water and Space Heating	1998
Letz, T.	Evaluation et suivi des opérations liées au programme européen 1994 de promotion du plancher solaire direct à appoint intégré	1999
Letz, T.	Projet Thermie 75 maisons PSD : bilan du programme	1999
Lorenz, K.	Kombisolvärmsystem. Utvärdering av möjliga systemförbättringar	2001
Lorenz, K., C. Bales, and L. Broman	Performance Comparison of Combitanks using a six-day-test	1997
Lorenz, K., C. Bales, and K. Börjesson	Provning av ackumulatorsystem för solvärmeanläggningar	1996
Lorenz, K., C. Bales, and T. Persson	Evaluation of Solar Thermal Combisystems for the Swedish Climate	2000
Lorenz, K., T. Persson, and C. Bales	Comparison of External DHW Load Side Heat Exchange Units for the Production of Domestic Hot Water	1997
Lorenz, K., et al.	Variation of System Performance with Design and Climate for Combisystems in Sweden	1998
Mahler, B., Fisch, M.N., Weiss, W.	Large Scale Solar Heating Systems For Housing Developments	2000
Meir, M., et al.	Determination of the performance of solar systems with the calorimetric method	2002
Meir, M., J. Rekstad, and B. Sandnes	Solar Combisystems for a multi-apartment building - The Klosterenga residence in Oslo.	2000
Meir, M., J.Rekstad and B. Sandnes	Roof Integration of Large Collector Areas - Experiences from Norway.	2001
Mikkelsen, S. Jörgensen, L.	Solvärmeanlæg til rumopvarmning. En udredning baseret på to års målinger på anlæg i Greve og Gentofte.	1981
Neumann, C.	Small combined solar systems. Influence of different heating systems and building types on the thermal performance	1996
Oberndorfer, G., W. Beckman, and S. Klein	Sensitivity of Annual Solar Fraction of Solar Space Heating and Water Heating Systems to Tank and Collector Heat Exchanger Model Parameters	1999
Overgaard, L.L. and K. Ellehauge	Solar Combisystems in Denmark - Solar & Biomass systems	2000

**Author/ Editor Name****Reference Title****Year of publication**

Pauschinger, T., H.	Comparison Test of Solar Heating Systems for	1998
---------------------	--	------

Drück, and E. Hahne Pittet, T., et al.	Domestic Hot Water and Space Heating Measurements of a Solar Combisystem in Situ	2002
Rekstad, J., M. Meir, A. R. Kristoffersen Rekstad, J., et al.	Control and energy consumption monitoring in low temperature heating systems. Effective solar energy utilisation - more dependent on system design than on solar collector efficiency	2003 1999
Sandnes, B., R. Mullane, J.B. Rekstad and M.G. Meir	A solar energy storage with an integrated latent heat storage system.	2000
Schläpfer, B., et al.	Untersuchung von zwei Sonnenenergieanlagen zur kombinierten Wassererwärmung und Raumheizung in Mehrfamilienhäusern.	1986
Streicher, W.	Solar Combisystems From Small Niche Market to Standardized Application	2000
Streicher, W.	Minimizing the Risk of Water Hammer and Other Problems at the Beginning of Stagnation of Solar Thermal Plants a Theoretical Approach	2000
Streicher, W.	Solar Combisystems The Work of Task 26 of the Implementing Agreement on Solar Heating and Cooling of the International Energy Agency (IEA)	2002
Streicher, W., et al.	Vergleich von Kombisystemen, der Ansatz des IEA-SHC Task 26 "Solar Combisystems"	2002
Streicher, W.	Skriptum Sonnenenergienutzung (Lecture book)	2003
Streicher, W. and R. Heimrath	Vergleich und Optimierung von Solaren Kombisystemen	2002
Suter, J.-M., T. Letz, and W. Weiss	Solar Combisystems - Overview 2000	2000
Weiss, W. (ed.)	Solar heated houses – A design handbook for solar combisystems	2003
Weiss, W.	Solar Space Heating Under Central European Conditions	2000
Weiss, W., Fink, C., Thür, A.	Low-Energy Housing Estate "Sundays"	2000
Weiss, W.	Solare Raumheizungsanlagen	2000
Weiss, W.(ed)	IEA-SHC Task 26 Industry Workshop, Stuttgart, Germany	1999
Weiss, W.(ed)	IEA-SHC Task 26 Industry Workshop, Borlänge, Sweden	2000
Weiss, W.(ed)	IEA-SHC Task 26 Industry Workshop, Espoo, Finland	2000
Weiss, W.(ed)	IEA-SHC Task 26 Industry Workshop, Delft, The Netherlands	2001
Weiss, W.(ed)	IEA-SHC Task 26 Industry Workshop, Rapperswil, Switzerland	2001
<b>Author/ Editor Name</b>	<b>Reference Title</b>	<b>Year of publication</b>
Weiss, W.(ed)	IEA-SHC Task 26 Industry Workshop, Oslo, Norway	2002



Vejen, N.	Undersøgelse af solvarmeanlæg til rum- og brugsvandsopvarmning for "Sol&Træ" v. NNR.	1998
Visser, H., Weiss, W., Streicher, W.	International Attention For Assessment And Optimization Of Solar Combisystems	2001

Table 2: Contents of the reference library sorted by year of publication

<b>Year of publication</b>	<b>Author/ Editor Name</b>	<b>Reference Title</b>
2003	Weiss, W. (ed.)	Solar heated houses – A design handbook for solar combisystems
2003	Streicher, W.	Skriptum Sonnenenergienutzung (Lecture book)
2003	Rekstad, J., M. Meir, A. R. Kristoffersen	Control and energy consumption monitoring in low temperature heating systems.
2002	Weiss, W.(ed)	IEA-SHC Task 26 Industry Workshop, Oslo, Norway
2002	Streicher, W., et al.	Vergleich von Kombisystemen, der Ansatz des IEA-SHC Task 26 "Solar Combisystems"
2002	Streicher, W.	Solar Combisystems The Work of Task 26 of the Implementing Agreement on Solar Heating and Cooling of the International Energy Agency (IEA)
2002	Streicher, W. and R. Heimrath	Vergleich und Optimierung von Solaren Kombisystemen
2002	Pittet, T., et al.	Measurements of a Solar Combisystem in Situ
2002	Meir, M., et al.	Determination of the performance of solar systems with the calorimetric method
2002	Kovács, P. and U. Pettersson	Solvärmda kombisystem. En jämförelse mellan vakuumsolrör och plan solfångare genom mätning och simulering
2002	Jordan, U. and K. Vajen	Influence of the DHW profile on the Fractional Energy Savings - A Case Study of a Solar Combisystem
2002	Jordan, U. and K. Vajen	Einfluss verschiedener Beladeeinrichtungen auf den Ertrag eines Kombisystems
2002	Jordan, U.	Untersuchung eines Solarspeichers zur kombinierten Trinkwassererwärmung und Heizungsunterstützung
2002	Henden, L., J. Rekstad, and M. Meir	Thermal performance of combined solar systems with different collector efficiencies
2002	Bales, C.	Thermal Store Testing Evaluation of Test Methods
2001	Weiss, W.(ed)	IEA-SHC Task 26 Industry Workshop, Delft, The Netherlands
<b>Year of publication</b>	<b>Author/ Editor Name</b>	<b>Reference Title</b>
2001	Weiss, W.(ed)	IEA-SHC Task 26 Industry Workshop, Rapperswil, Switzerland
2001	Visser, H., Weiss, W.,	International Attention For Assessment And

	Streicher, W.	Optimization Of Solar Combisystems
2001	Meir, M., J.Rekstad and B. Sandnes	Roof Integration of Large Collector Areas - Experiences from Norway.
2001	Lorenz, K.	Kombisolvärmesystem. Utvärdering av möjliga systemförbättringar
2001	Johannesson, K. and J. Persson	Tillförlitlighetsanalys på solvärmda kombisystem. En metodik och en modell
2001	Fink, C., Purkarthofer, P., Weiss, W	Systemkonzepte für solare Kombianlagen von Mehrfamilienwohnbauten und Ergebnisse aus Langzeitmessungen
2001	Bony, J., et al.	Optimisation of Combisystems
2001		Tagung Solare Raumheizung 2001
2000	Weiss, W.(ed)	IEA-SHC Task 26 Industry Workshop, Borlänge, Sweden
2000	Weiss, W.(ed)	IEA-SHC Task 26 Industry Workshop, Espoo, Finland
2000	Weiss, W.	Solare Raumheizungsanlagen
2000	Weiss, W., Fink, C., Thür, A.	Low-Energy Housing Estate "Sundays"
2000	Weiss, W.	Solar Space Heating Under Central European Conditions
2000	Suter, J.-M., T. Letz, and W. Weiss	Solar Combisystems - Overview 2000
2000	Streicher, W.	Minimizing the Risk of Water Hammer and Other Problems at the Beginning of Stagnation of Solar Thermal Plants a Theoretical Approach
2000	Streicher, W.	Solar Combisystems From Small Niche Market to Standardized Application
2000	Sandnes, B., R. Mullane, J.B.Rekstad and M.G. Meir	A solar energy storage with an integrated latent heat storage system.
2000	Overgaard, L.L. and K. Ellehauge	Solar Combisystems in Denmark - Solar & Biomass systems
2000	Meir, M., J. Rekstad, and B. Sandnes	Solar Combisystems for a multi-apartment building - The Klosterenga residence in Oslo.
2000	Mahler, B., Fisch, M.N., Weiss, W.	Large Scale Solar Heating Systems For Housing Developments
2000	Lorenz, K., C. Bales, and T. Persson	Evaluation of Solar Thermal Combisystems for the Swedish Climate
2000	Hausner, R. and C. Fink	Stagnation behaviour of thermal solar systems
2000	Ellehauge, K. and L.J. Shah	Solar Combisystems in Denmark - The Most Common System Designs

**Year of publication**

**Author/ Editor Name**

**Reference Title**

2000	Ellehauge, K., L.L. Overgaard, and A. Sæbye	Erfaringer fra målinger på kombinerede solvarme- og biobrændselsanlæg
------	---	---

2000	Bales, C.	Evaluation of the Performance of Solar Combistores - Comparison of Three Test Methods
2000		Tagung Solare Raumheizung 2000
2000		Solare Raumheizungsanlagen
1999	Weiss, W.(ed)	IEA-SHC Task 26 Industry Workshop, Stuttgart, Germany
1999	Rekstad, J., et al.	Effective solar energy utilisation - more dependent on system design than on solar collector efficiency
1999	Obendorfer, G., W. Beckman, and S. Klein	Sensitivity of Annual Solar Fraction of Solar Space Heating and Water Heating Systems to Tank and Collector Heat Exchanger Model Parameters
1999	Letz, T.	Projet Thermie 75 maisons PSD : bilan du programme
1999	Letz, T.	Evaluation et suivi des opérations liées au programme européen 1994 de promotion du plancher solaire direct à appoint intégré
1999	Ellehaug, K., T. Kildemoes, and H.J. Jacobsen	Aktive solvarmeanlæg med større dækning af husets samlede varmebehov - udredning og skitseprojekter.
1999		Tagung Solare Raumheizung 1999
1998	Vejen, N.	Undersøgelse af solvarmeanlæg til rum- og brugsvandsopvarmning for "Sol&Træ" v. NNR.
1998	Pauschinger, T., H. Drück, and E. Hahne	Comparison Test of Solar Heating Systems for Domestic Hot Water and Space Heating
1998	Lorenz, K., et al.	Variation of System Performance with Design and Climate for Combisystems in Sweden
1998	Kovacs, P. and M. Sandberg	Results from Testing of Small Heat Stores for Domestic Hot Water and Space Heating
1998	Drück, H. and E. Hahne	Test and Comparison of Hot Water Stores for Solar Combisystems
1998	Dahm, J., et al.	Evaluation of storage configurations with internal heat exchangers
1998		Tagung Solare Raumheizung 1998
1997	Lorenz, K., T. Persson, and C. Bales	Comparison of External DHW Load Side Heat Exchange Units for the Production of Domestic Hot Water
1997	Lorenz, K., C. Bales, and L. Broman	Performance Comparison of Combitalks using a six-day-test
1997	Eder, M., et al.	Heizen mit der Sonne - Handbuch zur Planung und Ausführung von solaren Heizungssystemen für Einfamilienhäuser
<b>Year of publication</b>	<b>Author/ Editor Name</b>	<b>Reference Title</b>
1997		Tagung Solare Raumheizung 1997
1996	Neumann, C.	Small combined solar systems. Influence of different heating systems and building types on the thermal performance

1996	Lorenz, K., C. Bales, and K. Börjesson	Provning av ackumulatorsystem för solvärmeanläggningar
1996	Drück, H. and E. Hahne	Thermal Testing of Stores for Solar Domestic Hot Water Systems
1996		Tagung Solare Raumheizung
1995	Boye-Hansen, L. and S. Furbo	Solvarmeanlæg med tømning
1995		Solare Raumheizungsanlagen
1993	Ellehaug, K.	Monitoring of Solar Heating Systems Marketed in Denmark
1993	Ellehaug, K.	Målinger på solvarmeanlæg til sommerhus i Gilleleje. Et solvarmeanlæg til kombineret opvarmning af brugsvand, gulvvarme, svømmebassin m.m
1993	Ellehaug, K.	Målinger på solvarmeanlæg til kombineret brugsvands- og rumopvarmning. 5 markedsførte solvarmeanlæg installeret hos anlægsejerne
1992	Ellehaug, K.	Combined Solar Heating Systems for Domestic Hot Water and Space Heating
1991	Ellehaug, K., L.L. Overgaard, and A. Sæbye	Solvarmeanlæg til kombineret brugsvands- og rumopvarmning. Udvikling af konkurrencedygtige anlæg. Beregninger samt forsøgsanlæg.
1991	Duffie, J.A. and W.A. Beckman	Solar Engineering of Thermal Processes
1990	Jaboyedoff, P.	Kombinierte Solaranlagen zur Wassererwärmung und Raumheizung - Synthese, Planungsempfehlungen. Research Project 'Praxisgerechte Regeln zur optimalen Planung und Ausführung von Sonnenenergieanlagen
1990	Jaboyedoff, P.	Installations solaires combinées de production d'eau chaude sanitaire et de chauffage -- Planification, synthèse.
1990	Jaboyedoff, P.	Installations solaires de production combinée d'eau chaude sanitaire et chauffage à injection directe -- Analyse paramétrique.
1990	Jaboyedoff, P.	Installations solaires de production combinée d'eau chaude sanitaire et chauffage à injection directe Modélisation, validation.

<b>Year of publication</b>	<b>Author/ Editor Name</b>	<b>Reference Title</b>
1989	Jaboyedoff, P.	Installations solaires compactes de production combinée d'eau chaude sanitaire et chauffage -- Etude paramétrique, règles pratiques de dimensionnement.
1989	Jaboyedoff, P.	Elaboration et validation d'un programme de simulation dynamique d'une installation solaire à

		production combinée d'eau chaude sanitaire et chauffage.
1988	Bergmeijer, P. and A. de Geus	Evaluation of the Dutch Second Generation Solar Heating Systems
1988	Andersen, N.	Solvarmeanlæg til rumopvarmning og varmt brugsvand. Demonstrationsanlægget i Ejby
1986	Schläpfer, B., et al.	Untersuchung von zwei Sonnenenergieanlagen zur kombinierten Wassererwärmung und Raumheizung in Mehrfamilienhäusern.
1981	Mikkelsen, S, Sønderskov - Jørgensen, L.	Solvarmeanlæg til rumopvarmning. En udredning baseret på to års målinger på anlæg i Greve og Gentofte.

## **1.4 The reference library software**

For the compilation of this database an application software, End Note from Isi Research Soft, has been used. This program can gather and maintain bibliographic references, integrate online searching, reference database management, and bibliography-making and also features Internet connection to hundreds of libraries. Of course, the modest size of this database makes it maybe even easier to maintain in a more general and widespread software. However, the choice of the group was to use this more specialized program.

Three export formats are available: RTF, plain text and HTML

## **1.5 Documents for download**

On [ftp://ftp.sp.se/public/solarcombisystems\\_references](ftp://ftp.sp.se/public/solarcombisystems_references) the database contents in 3 different formats can be downloaded. The formats are \*.enl (the default End Note format), \*.txt and \*.htm. For those interested in exploring the data base using the End Note program, an 30 days free trial version of the software can be downloaded from <http://www.isiresearchsoft.com/>. Some guidance for the use of the software is also given in the document "references manual.doc" at the ftp-address above.