



Task 45

Subtask B-D3

Report on Research Requirements/Ongoing Research

October 24-25, 2011

Overview

- Survey distributed (updated mailing list) September 29
- 5 responses received: Austria (1), Germany (2), Canada (2)
- 22 research topics submitted in the responses
- Acknowledge and thank:
 - Thorsten Urbaneck (Chemnitz University of Technology)
 - Dan Bauer (ITW, University of Stuttgart)
 - Sabine Putz (S.O.L.I.D.)
 - Michaël Kummert / Michel Bernier (Ecole Polytechnique)
 - Doug McClenahan / Bruce Sibbitt (Natural Resources Canada)

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Research Topics

- Of the 22 topics:
- 17 seemed to fall into 6 common themes
- Initially the other 5 appear to have less in common.....

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Common Topics

Cost Reduction (3 + 2)

- Inexpensive tank liners
- Inexpensive high temperature submersible pumps
- Cement pillars as boreholes for new buildings (2x use)
- Inexpensive installation techniques for high temperature boreholes
- Effective construction technology

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Common Topics

Improved Models (3)

- Better models (e.g. TRNSYS)
- Interaction of large in-ground tanks with a borehole field
- Small storage at higher temperature under a large store possibly with heat pump

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Common Topics

Improved Control Strategies (3)

- Improved control strategies
- Evaluate improved control strategies and equipment for improved performance and reduced electricity use
- Development of physical 7 control strategies to improve borehole store temperature management

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Common Topics

Improved Insulation (2)

- Reduced heat losses; improved insulation
- Better heat insulation

Improved Stratification (2)

- Improved stratification (pits & boreholes)
- Better charging & discharging devices (stratification) with hydraulic integration

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Common Topics

Alternate Sizes (2)

- Larger stores up to 1,000,000 m³; needing special concepts (e.g. crushed stone & water under main store)
- Adaptation of large (>1000 m³) stores to medium sizes (50-700 m³) for multi family houses with solar heat pump

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Individual Topics

- Observation/documentation of temperatures for large solar thermal installations (& their applications)
- Storage under sports stadium football field on relatively wet land
- More robust construction materials (tanks & pits)
- New borehole design with double u-tube / 2 independent circuits
- Optimization of seasonal storage temperature level

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