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Session 2

Energy demand versus system design and

documentation of energy uptake

Workshop on Closed Loop Borehole 7-8. sept. 2011





Energy demand

- In new buildings:
 U-values and calculation
- In old buildings: Measurement of existing use of energy



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Specific issues affecting the energy demand

Family size

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- Habits of daily life
- Electrical equipment
- Isolation of the house





How can we measure the energy uptake from ground ?

We need to know

- ΔT (Temperature difference of brine in and out)
- Flow velocity of brine
- Heat capacity of brine

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Instruments for mesurement

Flow meter

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(ultrasonic or inductive magnetic ?)

Constant flow or dynamic ?

Energy meter calculation – sum of total energy

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Heat capacity of brine

	% in IPA-sprit	% in Brine	Heat capacity	Density
Ethanol	90 %		2440 J/kg*K	
Isopropanol	10%		2560 J/kg*K	
IPA-sprit	100%	33,3 %	2452 J/kg*K	0,789g/ml
Water		66,7 %	4184 J/kg*K	1,0
Brine			3608 J/kg*K	0,93 kg/l

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