



IF IT SOUNDS TOO GOOD TO BE TRUE...

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The slide features a background image of a hand holding a glowing lightbulb underwater, surrounded by bubbles. The text is centered in a bold, dark blue font.



CONTENT

- Waterbedrijf Groningen and Energy
- History wastewater-heat-usage
- Riothermie Groningen
- Riothermie Bedum
 - Under construction (!)

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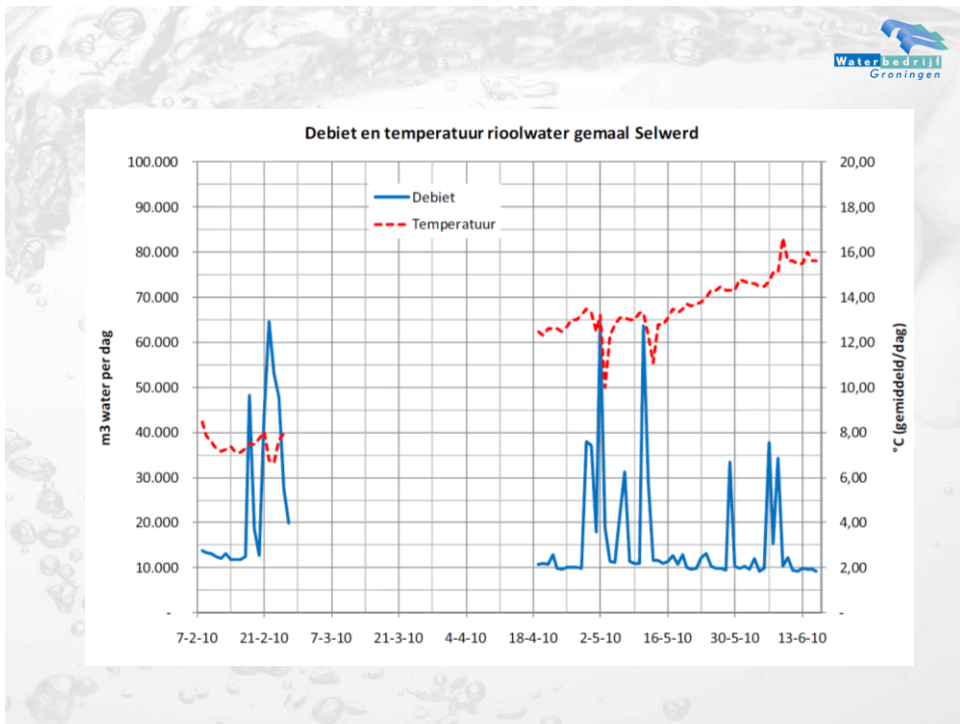
WATER AND ENERGY

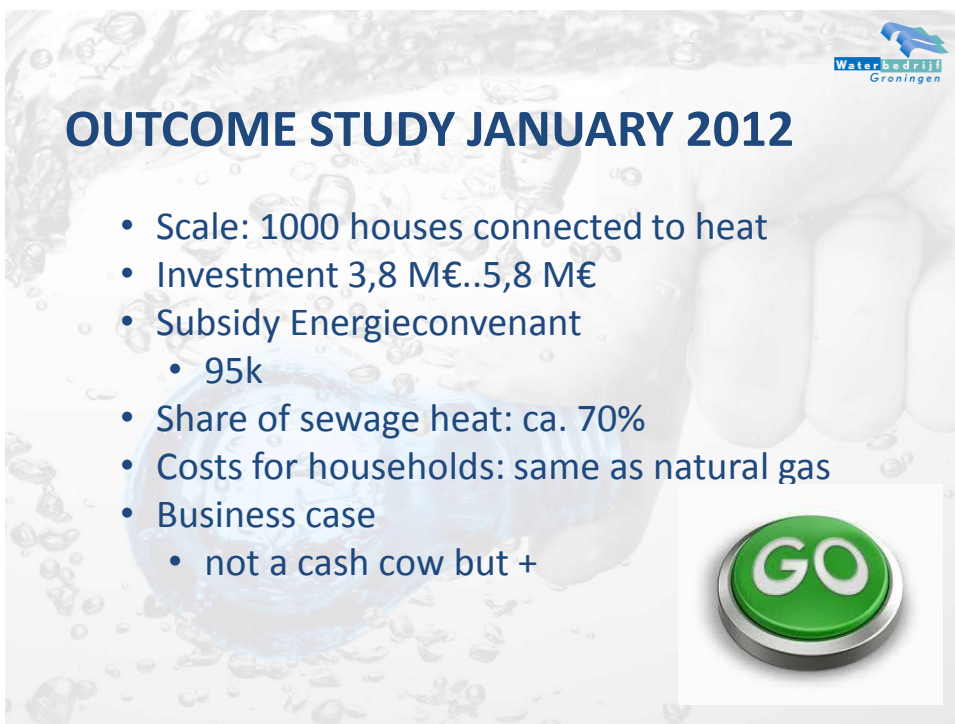
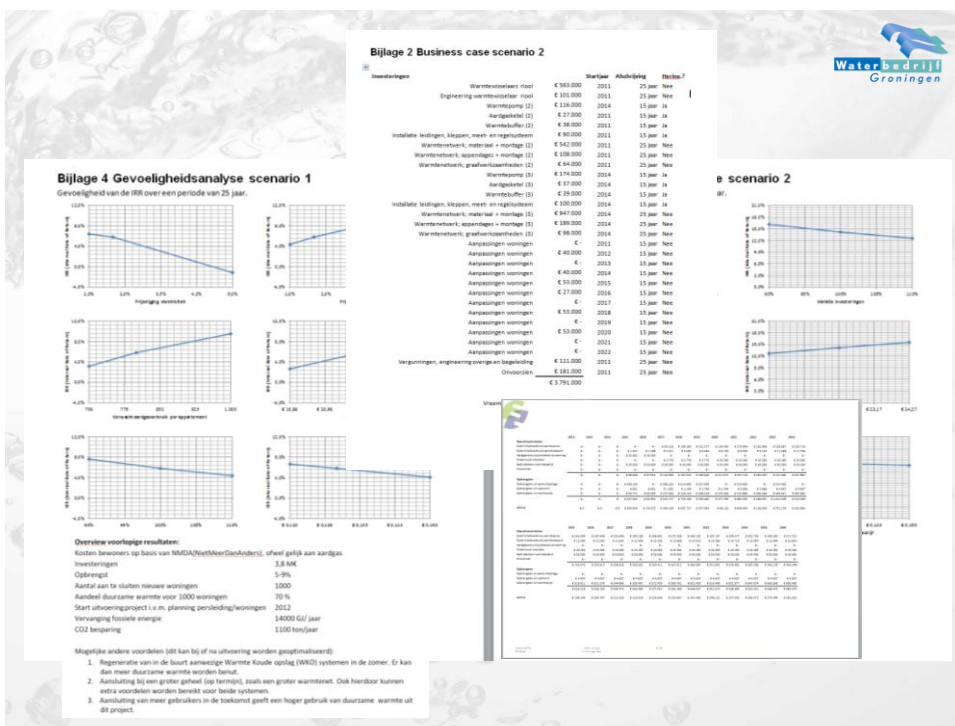
- Watercompany-> water transport
- Energy -> transport water
- Heat-Cold Storage, heat distribution grids
- Research BTO KWR
 - Desk study
 - With Interreg : field-test



HISTORY

- KWR-bto deskstudy:
 - Small scale : 25 houses
 - Outcome: No small heat exchanger available, Lack of economy of scale
- Study Students Van Hall
 - Challenge Use of sewage heat,
 - Compare to gas fired boiler and heat/cold storage
 - Outcome: Ex Aequo (not taking overhead costs into account)
- Study with waterpartners (Waterpas)
 - Press Sewage
 - Participants
 - Waterschap Hunze en Aa's & Waterschap Noorderzijlvest
 - Gemeente Groningen & Waterbedrijf Groningen
 - Advisor: EKwadraat



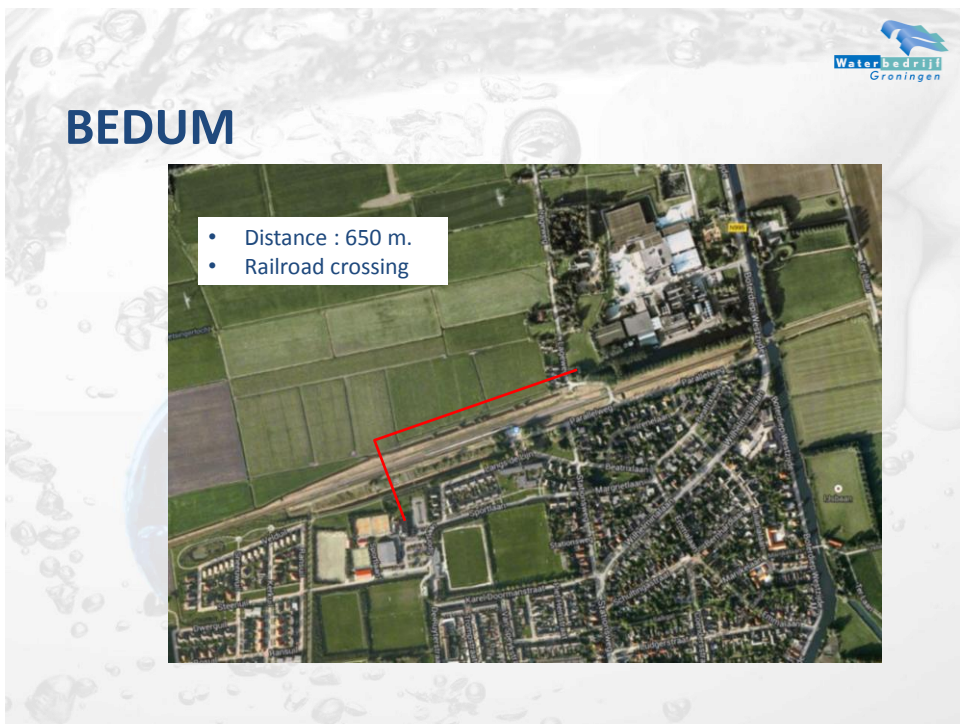
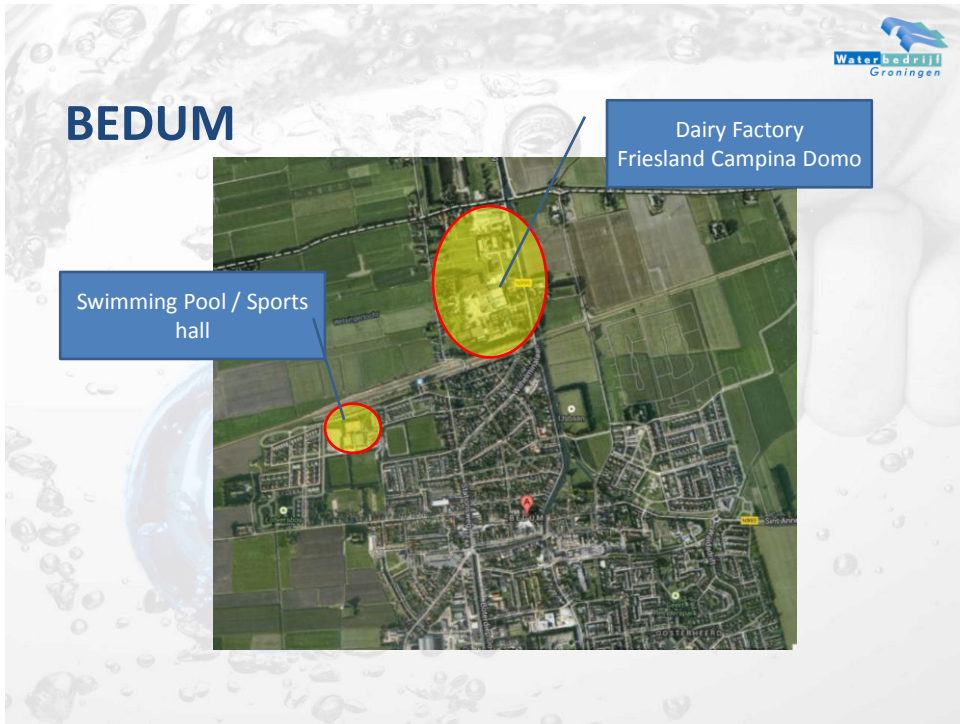




IF IT SOUNDS TOO GOOD TO BE TRUE

- Crisis hits Housing Association
- Building volume drops 200 ->20 houses/yr
- Quest for alternatives
 - Schools
 - Offices
- Project put on ice








BEDUM: TYPICAL

- FCD
 - >5000 m³/day wastewater
 - Temperatures 22°C..35°C
 - Salt water 3000 mg/l
- Zwembad De Beemden
 - Anual gas consumption: 230.000 m³ gas
 - Equals 150 households
 - Watertemperature 29°C..31°C



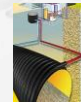
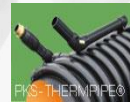
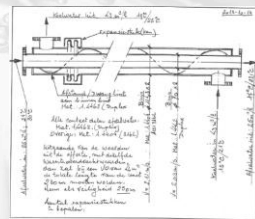

BEDUM TIMELINE

- 2007/2008: go
 - Study 60°C waste heat -> heat grid
- 2009: no go
 - FCD decides to use own waste heat
- 2010 : maybe
 - Local political party presses use sewage heat
- 2011 : study period
- 2012 : no go
 - heat pump with gas engine
 - Renovation air treatment reduces 50% energy use
- 2013 : no/yes/no/yes
 - Electrical heat pump + natural gas fired boiler
 - Subsidy project Groningen transferred to project Bedum
 - Risk availability sewage heat: Waterbedrijf Groningen



UNDER CONSTRUCTION...

- Realisation: july..sept
- Choices to be made:
 - Type heat exchanger
 - Performance
 - Location
 - Planning
 - Grid
 - Insulated or not?
 - Trace/route
 - Heatpump
 - Simple / lower costs and cop
 - Advanced /higher cop and cost



FINDINGS.....



- Use of sewage heat is HOT
- But:
 - Are customer(s) for the heat close to the sewer?
 - Scale of economy?
 - Is use of sewage heat the best available option?
 - Sewage-Waste heat: who guarantees availability
 - Sewage heat use is similar to heat-cold storage
 - Just heat
 - No thermal balance needed
 - Heat exchanger sewage heat is expensive
 - 'Well' temperatures lower than heat-cold storage
 - No good economical solution for tapwater -> 60°C
 - Not a cash cow
 - Long period project development (>4 yrs.)
 - Need for an system-operator

• The devil is in the detail

The devil is in the detail!

