Greywater Recycling Plant

HUBER GreyUse®
Saving fresh water in hotels

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- High greywater production, depending on hotel standard
- In most cases separately laid lines due to room division
- The produced greywater exceeds the fresh water demand for toilet flushing
- Constant occupancy with a regular greywater production

It therefore seems obvious to collect the greywater separately and treat it to obtain service water.
Plant Engineering

HUBER GreyUse® - Application in Hotels

- Installation in a cellar room
- HUBER GreyUse® - plant engineering

- No odour, low noise
- The greywater (process water) treated in the HUBER MBR is suitable to be reused for:
  1. Toilet flushing
  2. Laundry washing
  3. Irrigation

Fig. 2: Schematic diagram with HUBER GreyUse® Plant

→ Greywater recycling reduces fresh water demand!
Example

HUBER GreyUse® - Example case Berlin

- 4 star hotel
- 400 beds (221 rooms)
- Constant occupancy
- Separate collection of greywater from showers and bathtubs (greywater amount: $\sum \sim 20.5 \text{ m}^3/\text{d}$)
- Reuse of treated greywater for toilet flushing (service water demand: $\sum \sim 12.6 \text{ m}^3/\text{d}$)
- Potable water price: 2.13 €/m³ (net)
- Wastewater price: 2.60 €/m³ (net)
- Costs for toilet flush water (supply and disposal): ~ 21,753 €/a

Fig. 3: Arabella Sheraton Hotel in Offenbach/ Main

Fig. 4: Day hydrograph of greywater production and service water consumption in the hotel
Economic Efficiency

HUBER GreyUse® - Investment Costs

Net costs of the HUBER GreyUse® solution of flow diagram

<table>
<thead>
<tr>
<th>Costs</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>HUBER GreyUse® unit</td>
<td>47,553 €</td>
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<tr>
<td>Pipelines</td>
<td>20,000 €</td>
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<tr>
<td><strong>Total investment</strong></td>
<td><strong>67,553 €</strong></td>
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<td>(Interest rate 4 %/a)</td>
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<tr>
<td>Maintenance and spare parts</td>
<td>2,301 €/a</td>
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<td>(estimated cost increase 2 %/a)</td>
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<tr>
<td>Power costs (14.5 ct/kWh)</td>
<td>2,560 €/a</td>
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<td>(estimated cost increase 5 %/a)</td>
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<tr>
<td><strong>Total annual costs</strong></td>
<td><strong>4,861 €/a</strong></td>
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<tr>
<td>Annual water and wastewater savings *</td>
<td>21,753 €/a</td>
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<tr>
<td>(estimated cost increase 2 %/a)</td>
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</tbody>
</table>

* cost savings are calculated from the reduced freshwater consumption and the lower wastewater treatment costs
If water and wastewater costs increase by 2% and power costs by 5%, the payback period is slightly below 4.5 years of operation!
References


Thank you for your attention!

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