Sustainable and decentralized drinking water supply with Mörk Desalin®
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1. Company Introduction

Mörk Water Solutions
Business Unit of
Mörk Bau GmbH & Co. KG

• Medium-sized family-run company

• 111 years Experience, founded in 1902

• Over 50 Mio € Turn Over (2012)
Approx. 80 Employees

• Core Competencies:
Engineering und Project Management
2. Vision Water Solutions

UN Millennium Development Goal 7: Environmental sustainability

Target: Halve, by 2015, the proportion of the population without safe drinking water

Worldwide, around 780 million people (11% of the world population) have no access to clean water.

Over 40 per cent of these people live in sub-Saharan Africa.

Quelle: UN (2012)
Providing 1 million people with clean drinking water by 2020 with mörk desalin®
3. Empowerment with Mörk Desalin®

Decentralized water supply without cost intensive infrastructure

Mörk Desalin® provides the water where it’s needed
3.1 Product Smart Unit

- Self-sufficient
- Sustainable
- Reliable

- Drinking water capacity: 100 l/h and 200 l/h
- Energy-efficient unit: 4 kWh/m³
- Dimensions: 4.50 m x 2.90 m x 1.80 m
- Operation without chemicals
3.2 Education

• Qualified training of operators and service personnel

• Knowledge transfer through local schools and universities

• Education of local residents in handling resources

• Training in hygiene standards and health aspects
3.3 Support

- Development of local service partners
- Integration of local resources and workers
- Support for village communities
- Profitable business models for social entrepreneurs
3.4 Mörk Desalin® in numbers

Cost per day to provide a person with drinking water for the next 10 years ................................................................. €0,35/day

Possible drinking water production capacity of a Mörk Desalin® Smart RO100SW unit................................................................. 1500 litres/day

Minimum drinking water requirement of a person.............................. 2,5 litres/day

Number of persons the plant can provide with water daily
............................................................................................................ 600 persons

Possible commitment of Mörk Water for a service agreement................................. 10 years

Cost of a plant including 10-year service agreement* ............................ 78.000 €

* Calculation example / dependent on local conditions
4. PPP Project in Tanzania

Well with salt intrusion in Chwaka, Zanzibar

Daily trip to harbour to access drinking water supply
4. PPP Project in Tanzania

Sansibar – A special Situation

- Drinking water supply is dependent on ground water
- The coastal population is constantly growing
- Growing tourist sector

➢ Steadily increasing demand for drinking water
➢ Saltwater intrusion, aquifer permanently destroyed

Source: Hansson (2010)
4. PPP Project in Tanzania

Project goal:

Sustainable, decentralized drinking water supply with Mörk Desalin® for remote islands on Zanzibar.
4. PPP Project in Tanzania

Opening in Chwaka, Sansibar 11/2011
4. PPP Project in Tanzania

Unit on the Island Kokota / Pemba  09/2012
4. PPP Project in Tanzania

Unit on the Island Kokota / Pemba  09/2012
## 4. PPP Project in Tanzania

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>Pamoja Zanzibar</strong></td>
<td>Business Partner</td>
</tr>
<tr>
<td></td>
<td>Installation; Service; Training of operators</td>
</tr>
<tr>
<td><strong>Karume Institute of Science &amp; Technology</strong></td>
<td>Education Partner</td>
</tr>
<tr>
<td></td>
<td>Cultural adaption of training curriculum; Integration in study course</td>
</tr>
<tr>
<td><strong>ZAWA</strong></td>
<td>Zanzibar Water Authority</td>
</tr>
<tr>
<td></td>
<td>Water tests; Owner of Kokota installation</td>
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<tr>
<td><strong>GIZ</strong></td>
<td>Project Partner</td>
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<td></td>
<td>Development policy support; Project implementation partner</td>
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<td><strong>Dow Chemical</strong></td>
<td>Development Partner</td>
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<tr>
<td></td>
<td>Assistance with development of technical concept; support with membrane expertise;</td>
</tr>
<tr>
<td><strong>University Karlsruhe</strong></td>
<td>Development and Training partner</td>
</tr>
<tr>
<td></td>
<td>Development of curriculum for training; cooperation with KIST Institute</td>
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</tbody>
</table>
4. PPP Project in Tanzania

Results:

1. 2 plants (Kokota | Chwaka) have been handed over to local operators
2. 600 people are being supplied with clean drinking water
3. Training course in water treatment and renewable energies has been established in cooperation with Pamoja Zanzibar
4. Service station is being operated with a local partner

Time frame: 05/2011 – 07/2013
5. Profitable Business Model

Study with FH Rottenburg: “only 1 of 55 models covers the running costs”

**Economic model** (real case on Kokota Island, Tanzania)

<table>
<thead>
<tr>
<th></th>
<th>100l/h (1500l/day)</th>
<th>200l/h (3000l/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Selling 300 TSH (15 €Cent)</td>
<td>60 canisters (20l)*</td>
<td>120 canisters (20l)*</td>
</tr>
<tr>
<td>+ Mobile Charge 200 TSH (10 €Cent)</td>
<td>30 mobile phones</td>
<td>60 mobile phones</td>
</tr>
<tr>
<td>= Monthly return flow</td>
<td>€ 360,--</td>
<td>€ 720,--</td>
</tr>
<tr>
<td>= Yearly return flow</td>
<td>€ 4320,--</td>
<td>€ 8640,--</td>
</tr>
<tr>
<td>- Service contract**</td>
<td>€ 3000,--</td>
<td>€ 4800,--</td>
</tr>
<tr>
<td>= Cash Flow (ROI)***</td>
<td>€ 1320,--</td>
<td>€ 3840,--</td>
</tr>
</tbody>
</table>

* 80% of the available water

** Depending on the exact location

**Salary for the operator, payback of the investment
6. Project Example Myanmar

Ngwe Saung Township, Ayeyarwaddy Delta

- 5 units for each region
- Salty wells
- Villages are not connected to public water network
- Education in water, hygiene and health issues
- 3,500 inhabitants in Thazin Township
- 950 inhabitants in Phoe Mg Hlaing and Gyn Lael
7. Outlook

R&D:

• Bigger container solutions with renewable energy supply e.g. for hotels in remote areas

• Filling of drinking water in reuseable bottles

• Inland Solutions for arsenic and fluoride ground water supported from BMWi
7. Outlook

New projects in development:

- **Tanzania**
  10 plants with water authority / hotels

- **Kenya**
  Cooperation with water authority

- **Myanmar (Burma)**
  10 plants with government, GIZ

- **Pacific Islands**
  Complete drinking water supply of an island group
Thank you very much for your attention!

www.moerkwater.com