Clean Water - A Global Solution

indistinguishable from magic

CleanBlu®

Los Angeles                       Hong Kong                           Zürich
Brisbane
Markus J Lenger
CEO and CSO CleanBlu Inc.
markuslenger@cleanblu.com
+1 – 949 – 200 – 6226
Areas of Expertise

Nuclear Decontamination
CleanBlu® is a company with over 25-years experience in the design, engineering and deployment of innovative patented solutions in water and wastewater processing and soil decontamination.

CleanBlu® and its sister companies have made numerous headlines by continually pioneering new innovations both locally and around the world.

CleanBlu® is committed to helping provide a healthier and sustainable environment for generations to come.
Global Water Crisis

1.5 MILLION CHILDREN DIE EVERY YEAR FROM DRINKING POLLUTED WATER.

UNICEF

International Emerging Technology Symposium April 24 – Clean Water – A Global Solution
Outdated Centralized Wastewater Processing

- 2000 year old Roman technology
- Expensive to Build and Maintain
- Expensive to Transport Wastewater
- Inefficient use of Energy
- Large Carbon Footprint
- Public Health Hazard
Innovative Decentralized Wastewater Treatment

- Recycle Wastewater Locally
- Efficient use of Energy
- Small Carbon Footprint
- Reduce Public Health Hazard
- No Sewers to build or maintain
- No single point of failure
- No Transportation of Wastewater
Bioremediation of Grease Trap Wastewater into recycled grey water

Stabilization, purification and recovery of biofuel from brown-grease to enable production of high quality ultra low sulfur diesel

In Situ Micro Wastewater Treatment Plant, processes the 80% water content and 15% solids of brown-grease

Installed in any grease or waste enclosure

Super Energy Efficient Components (50 Watts/element - $3.60/month)
BioElement

- No moving parts or clogging
- Corrosion resistant - contains no metal - all plastic
- Inexpensive, easy to clean, service and replace
- No passthrough
- Enhances gravity separation
- Built locally
- Certified and patented
- Sensors built in
- Made from recycled materials - 100% recyclable

Super Energy Efficient Components
(50 Watts/element - $3.60/month)
Easy Drop-in Installation
Live view and Time Lapse
Low Cost Decentralized Wastewater Treatment

- Reuse all wastewater
- Power independent - runs off 2 solar panels or 1 small wind turbine
- Computer controlled, web enabled, self-monitoring
- Low-skill maintenance
- Solar powered sterilization module produces drinking water
- No chemicals needed - fully biological
- No COD transfer
- >95% of system can be built locally
- 100% Reusable and recyclable Bioelements
- Remote viewing and controlling of a single smart phone
Global Implementation
China

- Population 1.365 billion
- Total Water Consumption = 554 billion m³ (146 trillion gal)
- Total Wastewater Produced = 53.7 billion m³ (14 trillion gal)
- 67.5% are not connected to a wastewater treatment system
- 54.3% are not connected to a sewer system (Source UN)
- Spending US$69 billion a year on Water Treatment (WHO)
- Per capita water resource only 25% of world average
- Annual usage per inhabitant 414 m³/year (110,000 gal/year)

Laos

- Population 6.2 million
- Total Water Consumption = 4.2 billion m³ (1.01 trillion gal)
- Least developed country rich in water resources
- 72% of population lives in the urban areas
- 55.2% have no access to Sanitation (Source WHO)
- 47% of population has no access to improved water source
- Annual usage per inhabitant 740m³/year (196,000 gal/year)
### China Treatment Costs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Usage</th>
<th>Cost RMB</th>
<th>Cost US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity Total</td>
<td>9,200 kWh/day</td>
<td>7,423</td>
<td>1,200</td>
</tr>
<tr>
<td>Aeration</td>
<td>2,188 kWh/day</td>
<td>1,172</td>
<td>189</td>
</tr>
<tr>
<td>Sludge Processing</td>
<td>964 kWh/day</td>
<td>781</td>
<td>126</td>
</tr>
<tr>
<td>Pumps</td>
<td>4,224 kWh/day</td>
<td>3,421</td>
<td>552</td>
</tr>
<tr>
<td>PAM Flocculant Polyacrylamide</td>
<td>25 kg/day</td>
<td>750</td>
<td>122</td>
</tr>
<tr>
<td>PAC Polymer Polyaluminium Chloride</td>
<td>0.5 ton/day 500 kg/day</td>
<td>385</td>
<td>63</td>
</tr>
<tr>
<td>Sludge Disposal</td>
<td>36 tons/day @ 0.0376 yuan/ton</td>
<td>1.35</td>
<td>0.2</td>
</tr>
<tr>
<td>Total Cost Energy and Chemicals</td>
<td></td>
<td>8,600</td>
<td>1,390</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost</th>
<th>RMB</th>
<th>US Dollar</th>
<th>Per</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>0.81</td>
<td>0.127</td>
<td>kWh</td>
</tr>
<tr>
<td>PAM</td>
<td>30,000</td>
<td>4,833</td>
<td>Ton</td>
</tr>
<tr>
<td>PAC</td>
<td>770</td>
<td>125</td>
<td>Ton</td>
</tr>
</tbody>
</table>
Shenzhen China
Shenzhen Project
DEWATS Advantages

- Lower cost of Wastewater Management/Maintenance to customer
- Level Monitoring and Alarming, Live Video Feed, Data Logging
- Smart System / Self Regulating - monitored via iOS App
- First in Industry Fuel Stabilization, Purification and Recovery
- Odor Elimination (fully aerobic)
- No Pumping, Excavate for Fuel Extraction Only
- Provides sustainable option to landfill disposal
- Provides unobtrusive maintenance cycle that is noiseless and odorless
- Smart Cities ready
Food Service Establishments

- FSE: Food Service Establishment, including hotel, restaurant, canteen, food processing factory etc.
- Solution for both Yellow-grease and Brown-grease.
- Yellow-grease: frier oil. It can be turned into biodiesel via a straightforward 2-step chemical process.
- Brown-grease: also known as FOG, fats, oils and grease, is converted to BioFuel via a 2-step chemical process.
Fuel Harvesting

- Converts Hydrocarbons including both brown and yellow grease
- Sulfur reducing microbes produce ultra low sulfur fuel
- Prevents Hydrolysis, reduces phosphates and heavy metals
- Treats the 80% water content of brown-grease inside the waste enclosure
- Pathogen elimination due to aerobic environment
- No need to pump and haul 80% wastewater, only biofuel
- No odor and full monitored alarming for customer
- Auto fuel recovery dispatch function via email or web

Highest Grade Biofuel available – far exceeding B-100 Biofuel Standard
## BioFuel vs Oil Production

Biofuel Production from Brown Grease using CleanBlu®

<table>
<thead>
<tr>
<th></th>
<th>10,000 gal Grease Interceptor</th>
<th>Install total</th>
<th>Cost</th>
<th>Microbes Monitoring Maintenance</th>
<th>Income from CleanBlu paid by Customer</th>
<th>ROI in month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Cost of CleanBlu</td>
<td>15,000</td>
<td>3,000</td>
<td>1,200</td>
<td>14,400</td>
<td></td>
<td>&lt; 17</td>
</tr>
</tbody>
</table>

**Biofuel produced annually**

<table>
<thead>
<tr>
<th></th>
<th>Total Brown Grease recovered (gal)</th>
<th>Amount of Biofuel 5%</th>
<th>Revenue of Biofuel $3.65/ gal</th>
<th>Revenue of Biofuel $3.65/ gal</th>
<th>Combined ROI in month</th>
</tr>
</thead>
<tbody>
<tr>
<td>( recovered every 60 days )</td>
<td>60,000</td>
<td>3,000</td>
<td>10,950</td>
<td>24,950</td>
<td>9</td>
</tr>
</tbody>
</table>

**Total Biofuel produced over compared well lifetime (10 years)**

|                              | 600,000                           | 30,000               | 109,500                       | 249,500                       |

**Total Barrels produced**

- Cost of CleanBlu plus Install: 18,000
- Cost of microbes etc.: 12,000
- Cost of fuel pumping: 15,000

**Total Cost per Barrel**: $31.50

**Total revenue per Barrel**: $174.60

**Net Revenue per Barrel**: $143.10
Sustainable Cities

- Capture and recycle all water
- Compost solid waste into energy
- Solar, wind and geothermal energy harvesting
- Self contained vertical farming
- Smart energy and communication grids
- Zero emission rapid public transport system
- Networked smart buildings
- Green spaces and bio-filtering
- Automated environmental monitoring
- Self regulating
• Smart Cities ready
• One app can control hundreds of systems
• CleanBlu® is developing Smart Cities standards with leading international standard and code authorities
• CleanBlu® DEWATS (decentralized wastewater systems) can communicate and coordinate with each other and interface other smart city systems
That's 5,000 children a day, that die from diseases due to lack of safe water.

more than 100 children died during this presentation from polluted water.

Clean Water is a global problem that needs a global solution.

Get involved and save innocent lives!
Markus J Lenger
CEO and CSO CleanBlu Inc.
markuslenger@cleanblu.com
+1 – 949 – 200 – 6226