

SCAUT process

German Federal Ministry of Education and Research calls for no waste water from homes and residential developments

With the support of the German Federal Ministry of Education and Research, a sustainable, multi-stage process that produces various water quality levels from waste water has been developed and is being successfully used for different practical applications. After two-and-a-half years, the **SCAUT process**, a modular decentralized technology, is mature and ready for immediate use to produce potable water and water for domestic use from different types of waste water on an integrated, sustainable basis.

The worldwide “**resource problem water**” is currently very obvious right on our doorstep, in Spain. Bottlenecks in the supply of potable water and water for domestic use are on the agenda, and SCAUT Forschungsgesellschaft mbH has the technology to use recovery methods to increase the available quantities of very high quality fresh water.

Ground and surface water pollution as a result of waste water that has been poorly treated or not treated at all causes additional problems for supplying the clean water people need. That has already been highlighted in 1992 in Rio, in 2000 at the World Water Forum in The Hague, and in 2003 during the Year of Fresh Water instituted by the United Nations.

In the meantime, pictures of dwindling rivers and lakes are seen all over the world, and rich people believe that centralized sea water desalination plants will provide sufficient potable water. However, that view of things tends to be increasingly problematic, due both to the plants' very high power consumption and the associated additional output of CO₂. It also runs counter to current thinking about reducing CO₂.

Desalination plants also require intensive, continuous cleaning with anti-scaling and anti-fouling agents, which is ecologically questionable since those agents are discharged untreated into the sea along with the very high salt loads that were removed in the desalination plants.

Waste water is the most abundant fresh water resource and is available everywhere in the world

It is economically feasible to treat waste water so it is much cleaner than it commonly is today. Most non-tight mixed water systems and the poor treatment of waste water at large-scale treatment plants using the well known processes are “dead ends,” according to the German Federal Environmental Agency [*Umweltbundesamt*]. Why do we discharge our largest source of fresh water into the sea when it can so easily be recovered to produce clean water that is suitable for household use and as potable water?

Based on those considerations, with the support of the Federal Ministry of Education and Research, we have now developed the **SCAUT process**, which is ready for use on any scale. In this way we are making a major contribution to helping the approximately 2 billion people on

Earth who will be without potable water by 2020 according to the United Nations. **There is no doubt that the consequence of this would be water wars.**

We think it is better to invest in sustainable – in other words economical and effective – water recovery plants. The market volume is immeasurably large and, unlike the methods that are currently being used, is affordable using the **SCAUT process**.

The **SCAUT process** allows savings of up to 90% of potable water resources thanks to recovery or makes it possible to increase the available quantities. This is not yet necessary in Germany, but it is increasingly necessary worldwide. Waste water is available everywhere, while salt water is found only on the coasts; moreover, without water there is no power, not even from the sun!

	SBR plant	Trickle filter plant	Planted bed system	Membrane plant	SCAUT process	Sewer Treatment plant size class 4
Waste water parameters						
CSB [mg/l]	< 90	< 150	<150	< 90	< 5	< 90 (<40°)
BSB ₅ [mg/l]	< 25	< 40	< 40	< 25	< 5	< 20 (< 8°)
NH _{4-N} [mg/l]	< 10	(< 10)	(< 10)	< 10	< 2	< 10 (2-3°)
N _{inorg} [mg/l]	(< 25)			(< 25)	(< 6)	< 18 (< 1°)
P	(< 2)	(< 2)		(< 2)	(< 0.02)	< 2 (< 1°)
Fecal coliform germs in 100 ml	> 1 million (< 100)	> 1 million	> 1 million	< 100	0.0	> 1 million
Filterable substances	50.0	75.0	75.0	0	0	< 20
Bacteriological potable water parameters						
Coliform bacteria in 100 ml	not achievable	not achievable	not achievable	not achievable	0	not achievable
E. coli in 100 ml	not achievable	not achievable	not achievable	not achievable	0	not achievable
Enterococci in 100 ml	not achievable	not achievable	not achievable	not achievable	0	not achievable
Colony count 20° C in 1 ml	not achievable	not achievable	not achievable	not achievable	0	not achievable
Colony count 36° C in 1 ml	not achievable	not achievable	not achievable	not achievable	0	not achievable
Clostridium perfringens (including spores) in 100 ml	not achievable	not achievable	not achievable	not achievable	0	not achievable
Pseudomonas aeruginosa in 100 ml	not achievable	not achievable	not achievable	not achievable	0	not achievable
Salmonella spp.	not achievable	not achievable	not achievable	not achievable	0	not achievable

(..) Not all plants are able to comply with this value

*) Diluted by outside water and rain water

A water recovery plant that uses the **SCAUT process** for a load of four or more residents (equivalents) comprises the following:

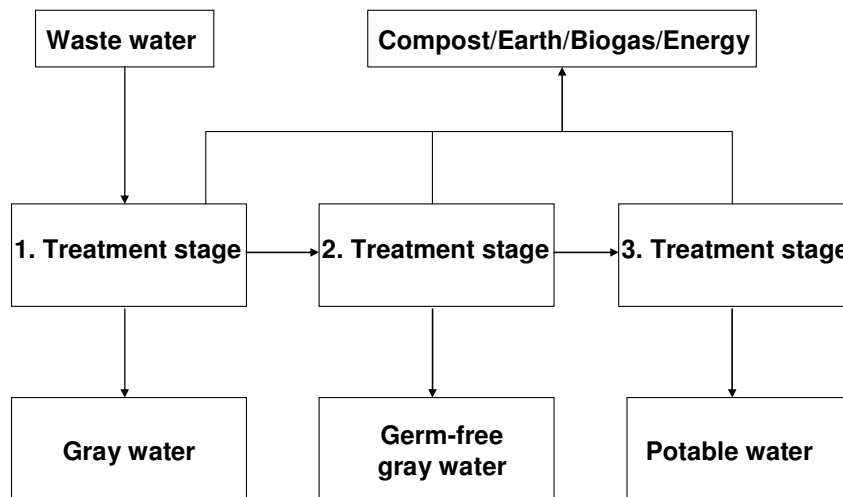
1. Water treatment plant with simple pretreatment technology, redundant ventilation units for the biological stage and ultrafiltration membranes
2. Physical-technical color removal and hygienizing units
3. Physical-technical treated water production
4. Fully automated control including remote monitoring

The following water qualities can be produced:

Following the first stage, a nearly germ-free water that is suitable for swimming and irrigation can be produced and can be used with no risk for watering in parks and to supply a garden pond or pool (interim storage of the water for the growth period, with a phosphorous value that is less

than 0.02 mg/l to avoid eutrophication/algae formation is also possible). The first stage is also able to break down substances that are difficult to biodegrade, such as residues from birth control pills or other drug residues. This is not possible using conventional treatment plants.

After the second stage, absolutely germ- and color-free water (in compliance with the bacteriological drinking water parameters according to the EU Drinking Water Regulation, Annex 1, Part 2), which is suitable for toilet flushing (or showers, baths, laundry, and cleaning) is produced. This water is free of bacteria and viruses. The CSB values are < 5 mg/l.



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Absolutely germ- and color-free water for (showers, baths, cleaning, and laundry), tooth brushing, dish washing, and the like is produced after the third stage. The water is free of all endocrine substances.

Use for cooking or drinking is not recommended for psychological reasons unless absolutely necessary.

Thus a mature solution to the problem of obtaining potable water and water for domestic use from waste water is available using the **SCAUT process**.

The need for worldwide investment is several hundred billion U.S. dollars per year.

Source: U.N. and EU reports

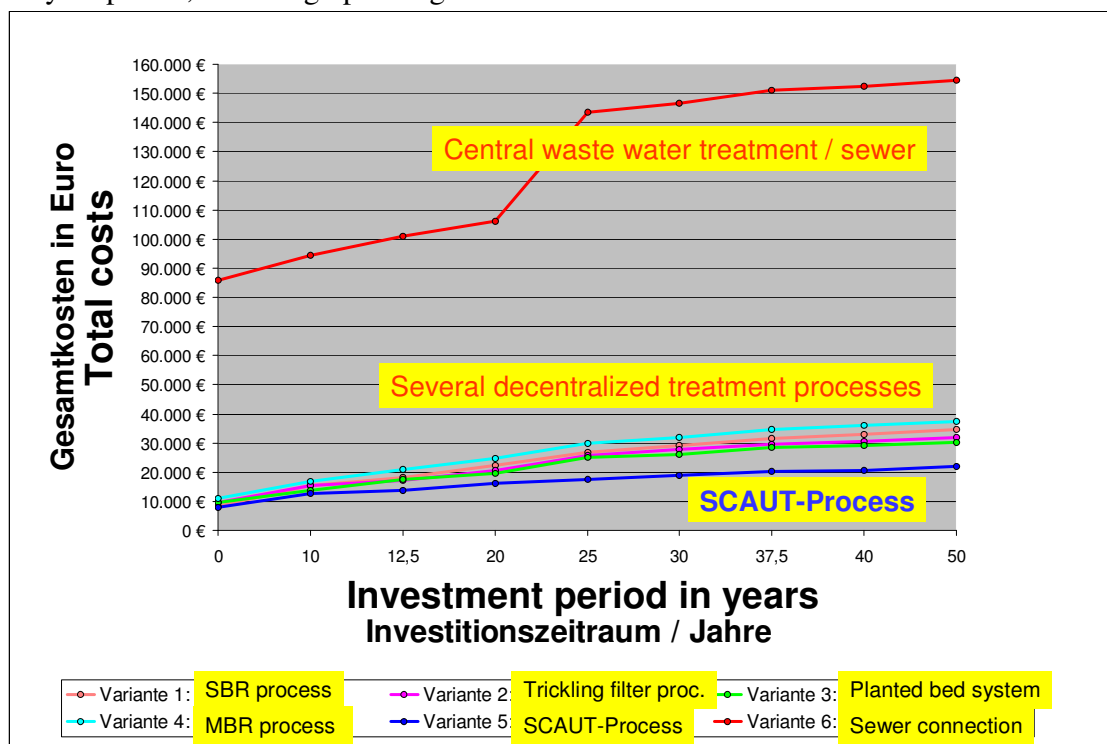
Growth in the environmental industry is not limited to Germany. The Environmental Technology Atlas indicates that the world market volume will more than double from about €1,000 billion in 2005 to €2,200 billion in 2020. German companies are likely to profit disproportionately from

this since they are very active in all segments of this market. The Atlas mentions the areas of **energy sustainable water management ... mobility.**

The up-and-coming markets of Asia and Eastern Europe are of particular interest to German exporters. According to estimates by the company, markets in Eastern Europe will be almost as large as Western Europe by 2020. India, China, and Russia will still be ahead of North America and well in advance of Japan.

Roland Berger study in Handelsblatt of May 30, 2007

The **SCAUT process** doesn't just offer a very competitive product for the "off-the-grid house" market niche (no mains power, no potable water supply, and no sewage discharge). The **SCAUT process** is also superior to all other known centralized and decentralized processes over a 50-year period, including operating and reinvestment costs.



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The **SCAUT process** is based on a mature biological-physical technology with adapted high-quality bacteria cultures. The plants can also be operated locally using solar power. That means that **waste water can be used as a source of fresh water** all over the world to produce potable water and water for household use.

Your innovative partner: Applied research and development
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