German Cleanwater Technology Delivery from 2021

GCW German Cleanwater KGaA

Research and Development, Production and International Sales

- Modular Systems and Power Plants (Water and Energy)
- consisting of saline raw water (seas, lakes, deep wells)
- process high-quality fresh water

© 2020 CM-Institute (Civilisations Matter)

www.cleanwater-ag.com GCW

Strictly Confidential

Not for further reproduction or distribution

Any use of this material without specific permission is strictly prohibited

Individual adaptation of each plant to existing saline well water, surface water and seawater

End product after water treatment: German premium water quality

Clean water for people and environment

11 Advantages of Plants from German Cleanwater AG at a Glance

- A new, patented technology which lets you use all your anorganic water sources, also those where traditional desalination processes are not appropriate for use such as e.g. contaminated wells and contamininated surface water
- Decentralized water treatment on site, supplied via raw water pipelines
- Treatment of more than 95-98% of the precious raw water
- Fresh water is also suitable for marketing by bottle and gallon filling
- No toxic fluorides in the treated water, as in membrane plants

...No brines as polluting waste, raw material extraction instead - Cradle to Cradle processes

...and robust module plants (fast installation, earthquake-proof)

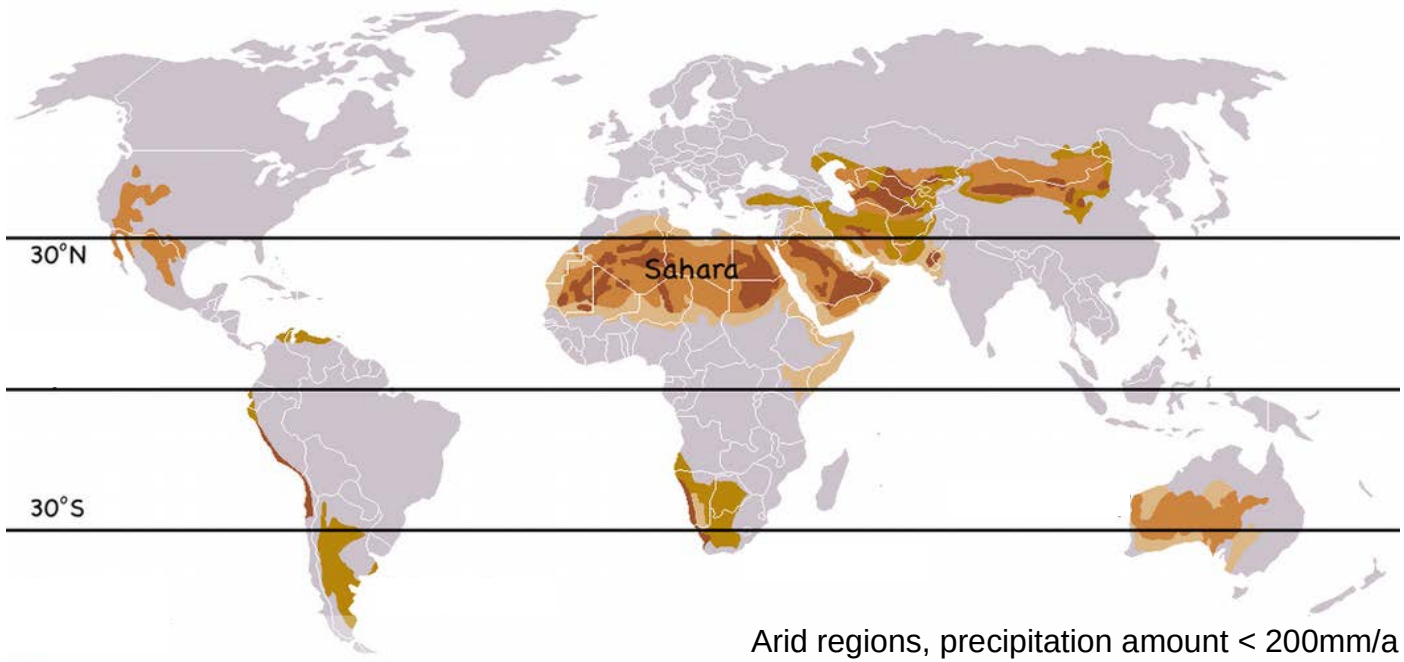
- High economic residual value after 20 years of operating time
- Low service and maintenance costs, no expensive further purchase of filters etc.
- Stand-alone plants are operable with 100% renewable energy systems
- Entire product range internationally absolutely competitive

900 Million People

lack access to clean drinking water

Many people live in continental semi-arid areas, for example, along the Historical Silk Road, the Middle East, Africa, parts of Latin America and Australia.

Regions with saline lakes, lagoons, and soils



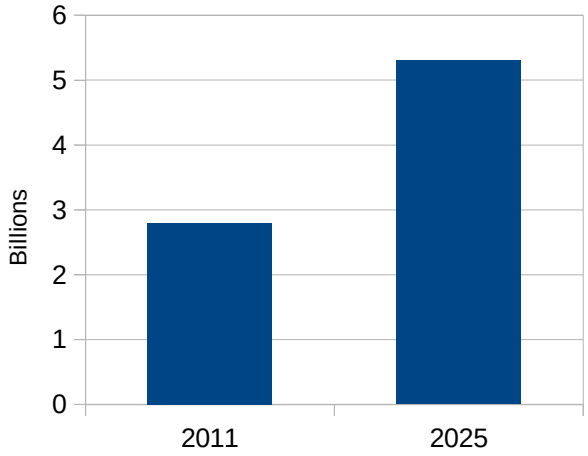
Arid regions, precipitation amount < 200mm/a

Key Challenges

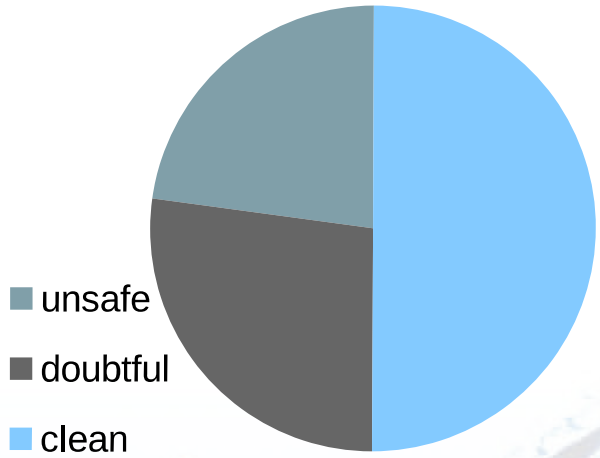
with Regards to Worldwide Water Demand and Water Quality

Number of People
living in water-stressed areas

(FAO, 2011)

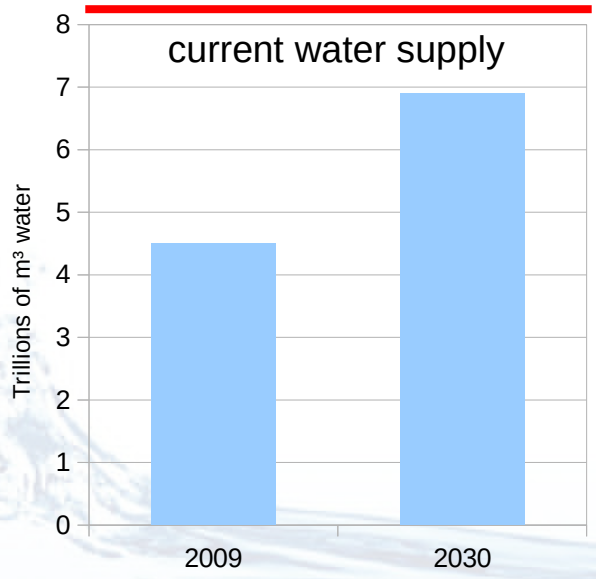


Roughly 50% of the
global population
uses water of dangerous
or doubtful quality
Challenges, drivers and solutions
(PwC 2012, p. 13)



Worldwide water demand vs.
current water supply

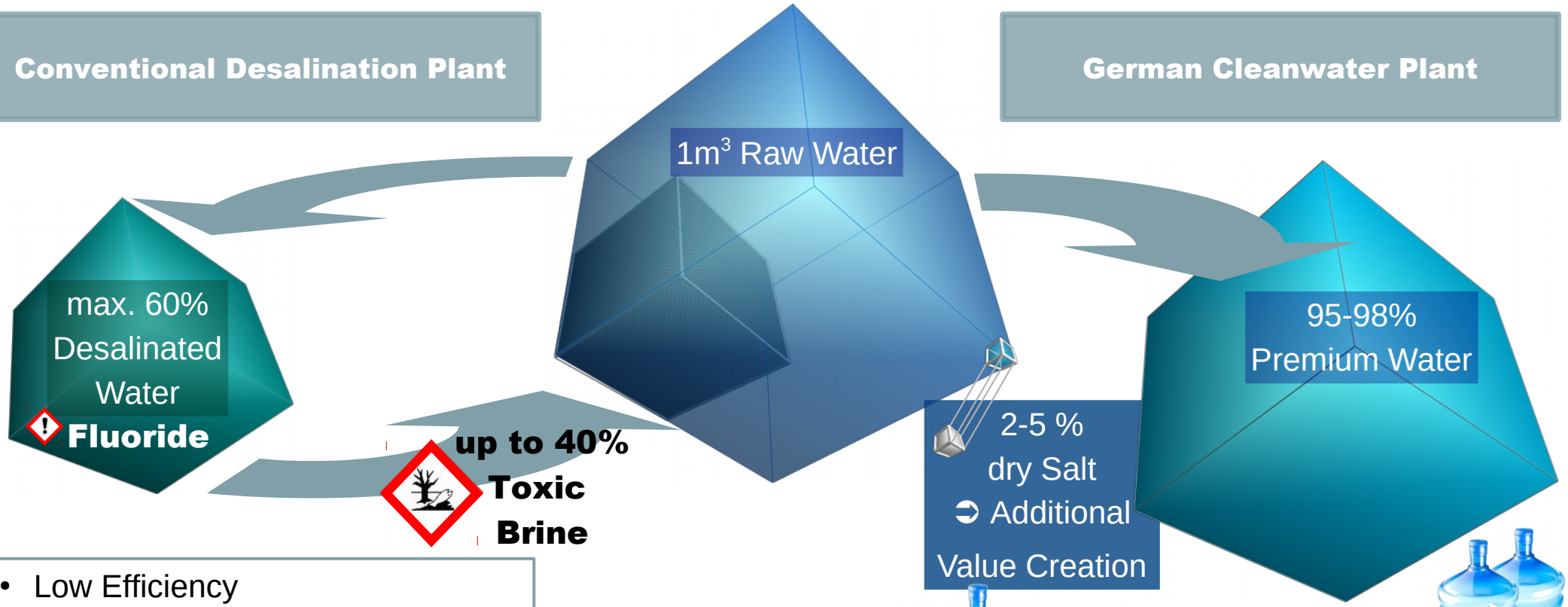
(2030 Water Resources Group. 2009)



General Comparison

Conventional Desalination Plant

German Cleanwater Plant



- Low Efficiency
- Water with Health Risks e.g. for Kidney Disease
- Destruction of Agricultural Area
- Reduction of Animal Food
- Raw Material Destruction

- Optimal Use of Resources, especially in the case of Inner-Continental Groundwater and Surface Waters
- Raw Material Extraction

Comparison of Prizes

Conventional Desalination Plant (R/O)		German Clean Water Plant
Enormous negative impact; Elevate soil & seawater salinity	**Environmental impact**	No negative impact
30% - 75% !	**Effective utilization of raw water**	95 %
Water often with inferior quality not possible because incl. Fluoride etc.	**End product**	Pure water that can be bottled
Brine	**Waste product**	Non
None	Additional Raw material produced	Salt 5 - 50 kg / m³
€ 0,60 – 1.10/m³	**Maintenance cost Hardware cost**	ca. € 0,60 - 0,79/m³
4 – 11 kWh	Energy Requirement per m³	12 kWh + crystallizer

Challenges, Products and Technologies

Desalination Plants

Modular Systems 1,200 m^3 / day
and special developments

Desalination Plant

Protection of Intellectual Property

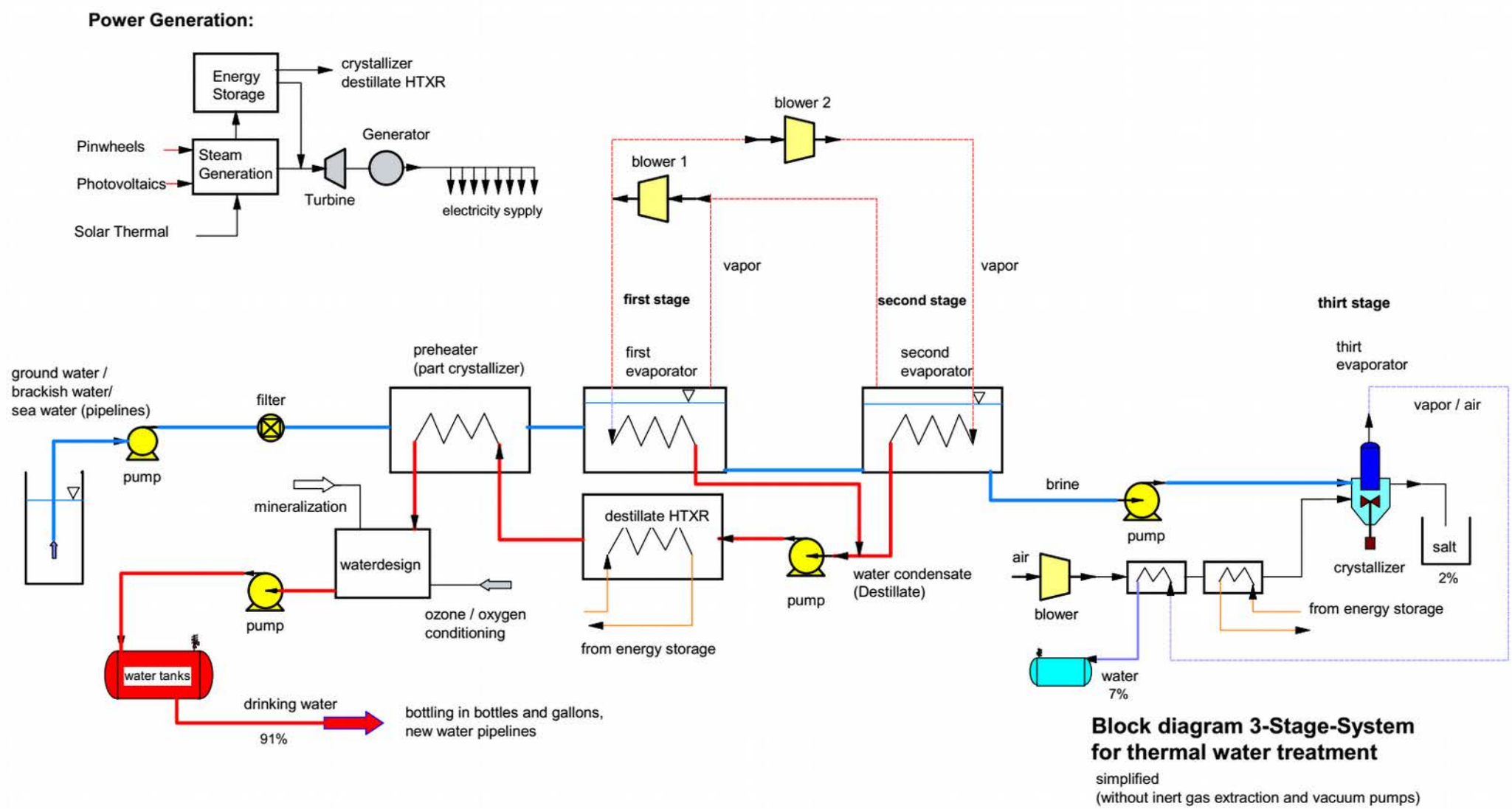
In January 2013, Wolfram R. Bauer, Rainer Holmig and Dr. Ludwig Weissflog filed an application for a patent on the entire process to a novel desalination device for drinking water production at the German Patent and Trademark Office. In January 2016, the patent was granted with number 10 2013 201 251 by the Patent Office in Munich/Germany.

The patentable invention is related to a technique for the operation of a water treatment plant for deposition of dissolvable pollutants in raw water. In addition, the patentable invention is related to a water treatment plant as well as the application of this technique for raw-water treatment. The water treatment plant serves for purification of surface and ground water and production of tap water, especially, drinking water respectively water for domestic use. Contaminations are in form of salts and/or toxic substances, especially, anorganic toxic substances, and/or radioactive elements.

IP as exclusive right of exploitation into GCW German Clean Water KGaA.

Desalination Plant

Block Diagram



Block diagram 3-Stage-System for thermal water treatment

simplified
(without inert gas extraction and vacuum pumps)

Desalination Plant

Description

The evaporation of the raw water in the distillation plant takes place in several steps until solubility stage of the salts in the water is nearly reached.

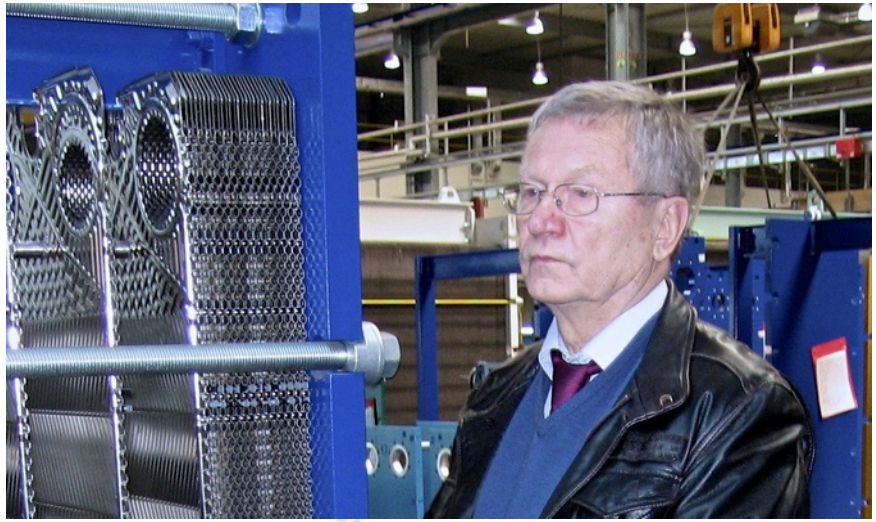
The highly concentrated brine will be subsequently vaporized in the crystalliser and the salts will be removed as dry substance. The drinking water is enriched with natural minerals without chemical additives.

The processes in the plant correspond to natural processes and meet all religious requirements for the use of drinking water.

The distillate which is generated in several steps of evaporation will be condensed in heat exchangers and in the crystalliser in counter flow to the incoming raw water.

It will be converted into drinking and ecological irrigation water in a subsequent conditioning step. During the conditioning step the water can acquire taste through adding minerals. The taste will correspond to the one preferred by the local population (water design).

In case of stand-alone plants the required thermal power for the crystallisers will be generated from solar thermal plants or from other local renewable energy where applicable.

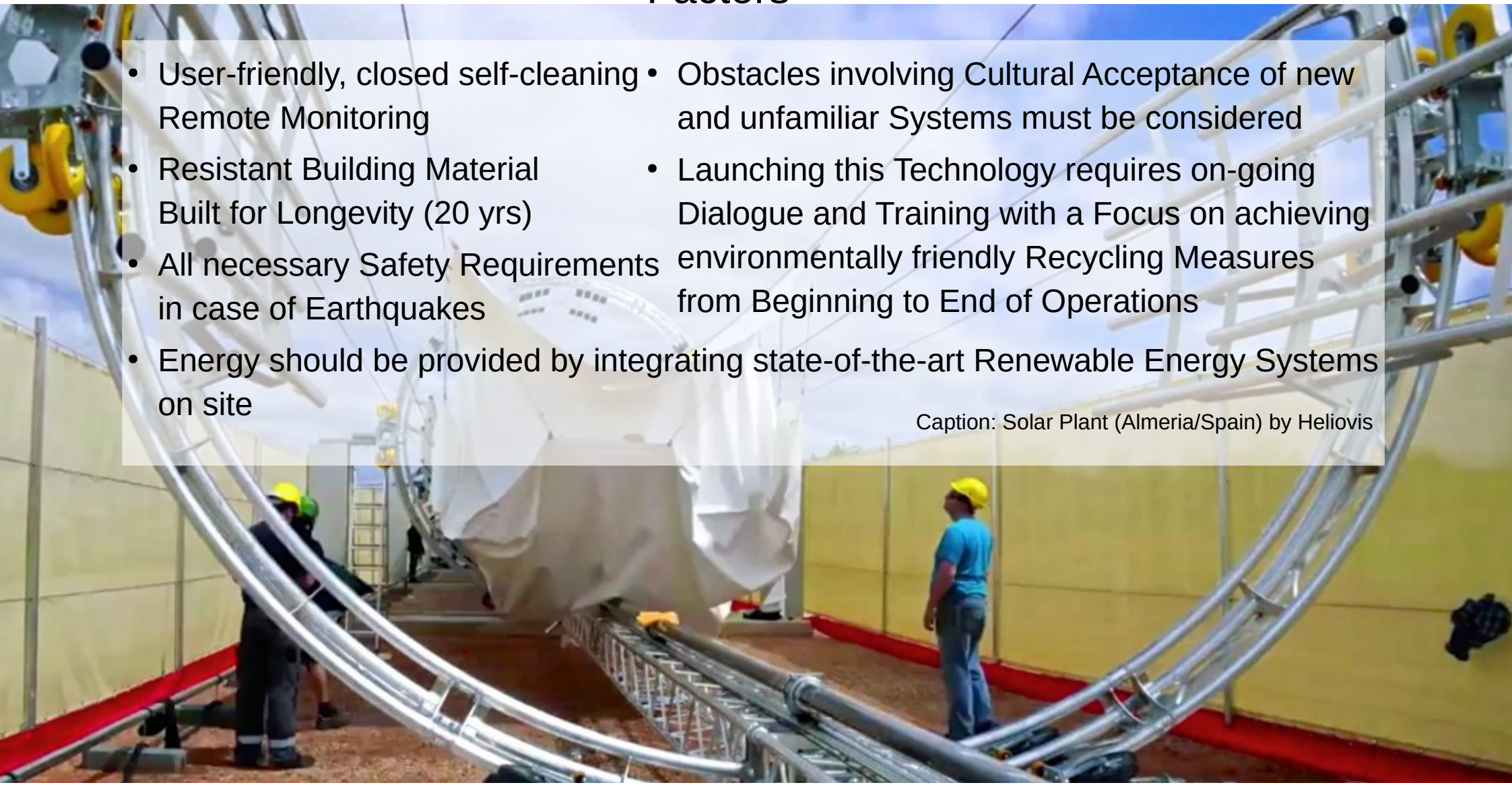


Chief Dipl.-Ing. Rainer Holmig with Heat Exchanger

Desalination Plant

Thoughts on Design and Contextual Factors

- User-friendly, closed self-cleaning Remote Monitoring
- Resistant Building Material Built for Longevity (20 yrs)
- All necessary Safety Requirements in case of Earthquakes
- Obstacles involving Cultural Acceptance of new and unfamiliar Systems must be considered
- Launching this Technology requires on-going Dialogue and Training with a Focus on achieving environmentally friendly Recycling Measures from Beginning to End of Operations
- Energy should be provided by integrating state-of-the-art Renewable Energy Systems on site



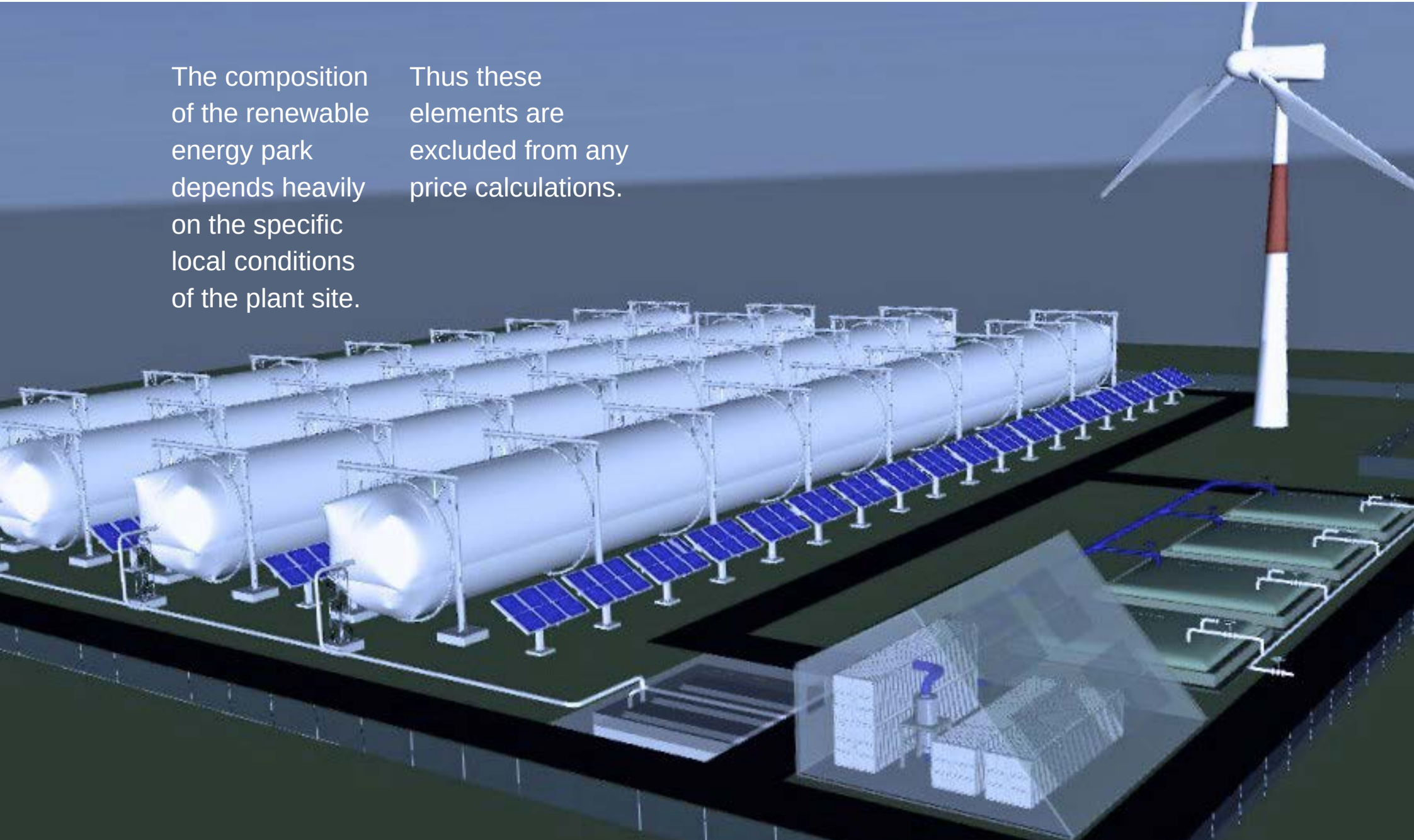
Caption: Solar Plant (Almeria/Spain) by Heliovis

Desalination Plant

Design (three times as big as below) for 1,200 m^3 of Drinking Water per Day

The composition of the renewable energy park depends heavily on the specific local conditions of the plant site.

Thus these elements are excluded from any price calculations.



Desalination Plant

Removed Contaminants by Evaporation

halogens
- Cl^- (chloride)
- Br^- (bromide)
- F^- (fluoride)

anions
- SO_4^{2-} (sulphate)
- CO_3^{2-} (carbonate)
- NO^{3-} (nitrate)
- PO_4^{3-} (phosphate)

metalloids
- As^{3+} and As^{5+} (arsenic)

alkali metals
- Li^+ (lithium)
- K^+ (kalium)
- Na^+ (sodium)

alkaline earth metals
- Ca^{2+} (calcium)
- Mg^{2+} (magnesium)
- Sr^{2+} (strontium)

heavy metals
- Ni^{2+} (nickel)
- Mn^{2+} (manganese)
- Cu^{2+} (copper)
- Fe^{2+} and Fe^{3+} (iron)

radioactive isotopes
- ^{90}Sr (strontium)
- ^{137}Cs (caesium)
- nephrotoxic uranium (^{235}U and ^{238}U)

Desalination Plant

From Raw Water to Product

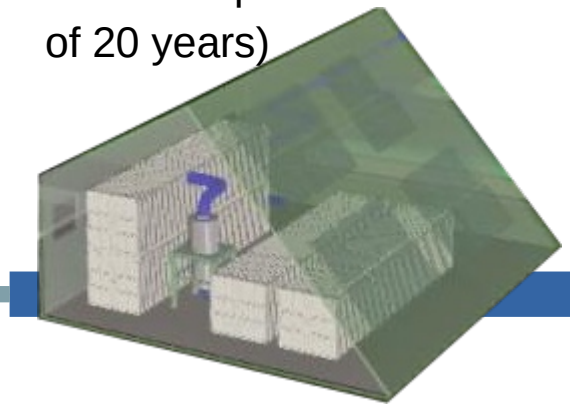
Seawater

Groundwater

Surface Water

GCW-Module-Plant

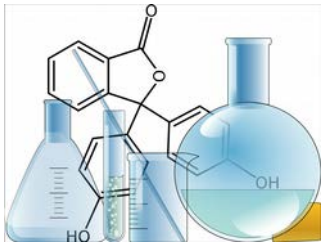
(its Hardware costs about 0.81 €/m³ Water over the operational life of 20 years)



- Treatment without Chemicals
- Treatment of 95-98% of the Raw Water
- Water Design with Minerals for Potable Water

Potable water

Distilled water



Industrial purposes

Clean Water

Drip irrigation

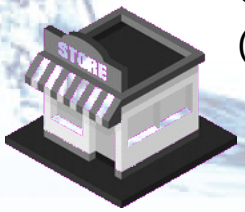
Salt

Industry

produce polyvinyl chloride, e.g. for water pipelines

Lithium Carbonate (at some Sites)

Environmentally friendly Disposal

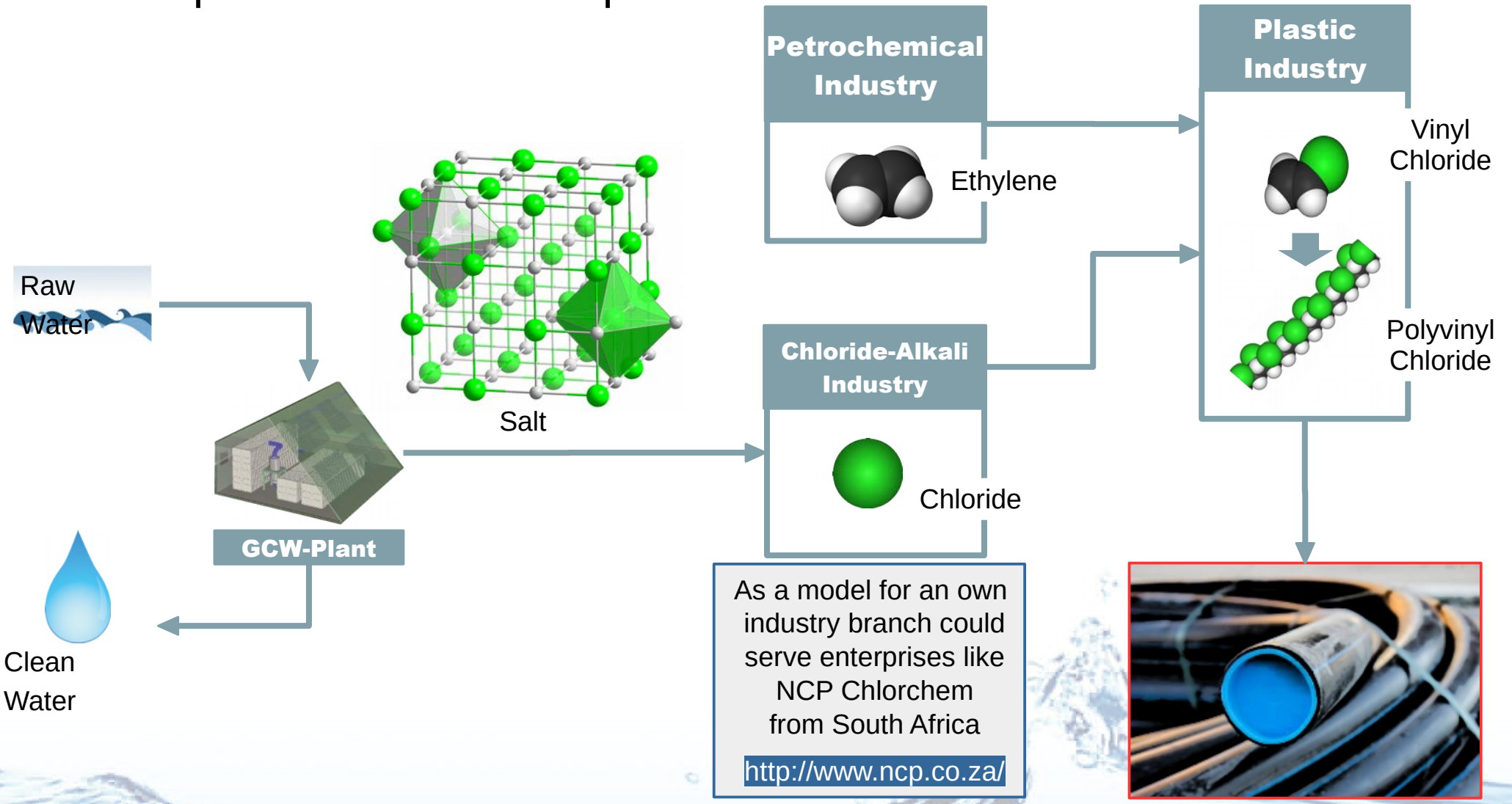


Food and Cosmetics, (if high purity)

Borehole Injection

Desalination Plant

We help to turn Salt into Pipelines



As a model for an own industry branch could serve enterprises like NCP Chlorchem from South Africa

http://www.ncp.co.za/

Executive Management

CEO

Wolfram R. Bauer

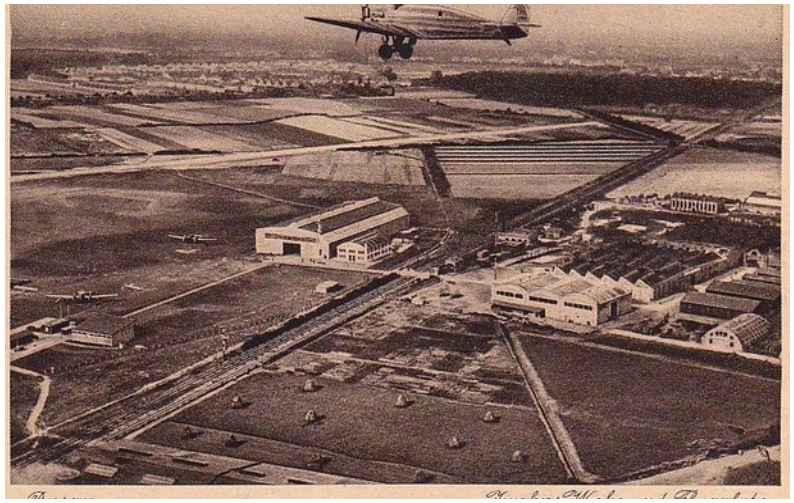
Berlin, Germany

Wolfram R. Bauer

- Founder and Director of CM-Institute (Civilisations Matter) e.V, Chairman of Euro-Asia.Partners Platform and Founder of Civilisations Matter Foundation
- Initiator / implementer of the conference series "Higher Reliability through Joint Development", addressing politics, science and economics in countries along the Historical Silk Road and the EU
- Organizer of "Berliner Salonabende", bringing together many hundreds of international leading scientists and political and economic representatives
- Leader of the international conference "Utilization of Inner-Continental Water Resources – Improved Supply of Drinking Water in Semi-Arid Rural Areas in China"
- Producer, director and author of numerous documentaries and participation in international foreign aid projects Awarded films: „Exodus from Uzbekistan“, „The Kogi“, „Oberwasser - with U-Boat to America"
- Extended working stays in Asia, North America, South America, Africa and all states in Europe
- Study in the field of Humanities at Universitiy Leipzig with a diploma in Theology

German Clean Water AG

Our Future Production Site at Dessau, Aerodrome



Historical JUNKERS Factories at Dessau

Future R&D-House and Production Hall in Planning

Reserved Area for the Construction of our Real Estate

German Cleanwater AG is about to acquire an exquisite estate at the historical site of the JUNKERS Factories at Dessau, Aerodrome.

The plan includes a building for research and development and a big production site.

German Clean Water

Organization Chart

CEO
Wolfram R. Bauer

Finance Director
Thomas Lange

PR

Counsel
JGB

Research & Development

Senior Process Instructor
Dipl.-Ing. Rainer Holmig

Development Director
Vimal Patel

Chemist for Process Engineering

Chartered Engineers, Mechanics, Robotic

Chartered Engineer, Thermodynamics

EMSR Engineers

CAD Constructors

Research, Database Maintenance and Documentation

Energy

Process Technology

Production

Production Director
Frank Lennicke

Engineer Heating/Water

Electricians

Construction Welders

Titanium Welders

Metal Workers

Mechanics

Warehousemen

Unskilled worker

Drivers

Trainee

Quality Assurance

Internat. Sales

Near- and Middle East

Asia

North and South Africa

South America

Australia

Service Compliance

Prcpl. Investigators
Dr. Gerd K. Hartmann | Dr. Erich Putz | Prof. Dr. Kai Mertins

HR & Purchasing Manager

Head:

Purchasing Manager: Georg Deubach

IT

Head: n.n.

Security

Infrastructure

Automation, Interface- and App-Development

Services

Reception & Visitor Service

Facility Mgmt.

Cleaning and Laundry

Security

Legal and Tax Consultancy

Patent AttorneysNat.
Gleiss&Große Dr. Chr. Dietz

Notaries Mock RA
LL.M. Prof. Dr. Walter Rust

Supervisory Board
Dr. jur. Joh.-Georg Blomeyer | Dieter Ernst | N.N.

Shareholders
Wolfram R. Bauer, Dr. Ludwig Weißflog, Rainer Holmig, Thomas Strebost, Dr. Georg Blomeyer, Dieter Ernst, Dr. Hauke Harder, Dr. Erich Putz, Dr. Gerd K. Hartmann, Ingo Babendererde etc. n.n.

Civilisations Matter Foundation
Chairman Foundation Board

Lead Developers & Shareholders

& the Foundation

Lead Developer & Shareholder

Dipl.-Ing. Rainer Holmig (Sen. Chief Planning Engineer)

Wurzen, Germany

- Planning and bringing into service of air separation systems for extraction of oxygen, nitrogen and argon in China, India, Romania, Czech Rep., etc.
- Design and development of expansion turbines for cold production in air separation units (Machine Factory Wurzen)
- Development of recovery systems to extract C3+ from flare gas at Propak Systems Ltd, Airdrie (Kanada); LGI Bonn and Wurzen
- Construction of a facility for the destruction of toxic gases; thermal installation for treatment of remnants after destruction of chemical agents in Kambarka and Potschep (Russia)
- Development of thermal desalination plant and Heat Storages at CM-Institute since 2008
- Study of Process Engineering at Technical University of Dresden, obtaining an Dipl-Ing. Degree

Rainer Holmig

Lead Developer & Shareholder

Dr. jur. Johann-Georg Blomeyer (Counsel)

Guadalajara, Spain

- Lawyer with ABB, Mannheim, specialized on international water projects and power plants (desalination plants in Saudi Arabia among others)
- Head of the legal department of MERO, Würzburg, producing innovative space grid systems, specialized on international license agreements (USA, Japan)
- Reform projects covering 25 years in nearly a dozen emerging countries (public procurement, antitrust law, intellectual property, etc.)
- Sen. Legal Consultant; CM Group Corporate Counsel since 2014

Dr. Johann-Georg Blomeyer

Lead Developer & Shareholder

Prof. em. Dr. rer. nat. Erich Putz (PI)

Graz, Austria

- At the University of Graz, Institute of Physics:

  Head of „Radiation and Air Pollution Research Group“
  Professor at the Dept. for Meteorology & Astrophysics

  Head of the weather and climate station for 25 years
- Managing research groups within international and national research projects as PI for many years
- Initiation and conduction of international measurement campaigns on solar radiation and preparation of international workshops
- Experience in development and testing of scientific instruments for meteorological application in general and for solar radiation
- Experience at global climate statistics

Prof. Dr. Erich Putz

Lead Developer & Shareholder

Prof. em. Dr. rer. nat. Gerd K. Hartmann (PI)

Bilshausen, Germany

- Scientist at the Max-Planck-Institute for Aeronomy (MPAe) Katlenburg-Lindau, investigating Earth atmosphere from ground, aircraft and space
- Consultant for information issues at the Institute for Intercultural Research (IIR) in Heidelberg/Zürich
- Principal Investigator (PI) of the NASA-ATLAS-MAS-Space Shuttle experiment. (MAS: Millimeter-wave Atmospheric Sounder)
- Full professor at UM (University of Mendoza, Mza., Argentina), „Remote Sensing for a conserving utilization of the environment", joint microwave measurements
- Acting chairman of the board of trustees of CM-Institute and Principal Investigator by the CM Drinking Water Project

Dr. Gerd K. Hartmann

Lead Developer & Shareholder

Dr. rer. nat. Hauke Harder (Issue Consultant)

Berlin, Germany

- Molecular physicist at the Institute for Physical Chemistry, Department of Chemistry and Physics, University of Kiel, Kiel, Germany (until 2000)
- Director of art project "Society for acoustical living assistance" (1989-1999)
- Composer and filmmaker with numerous exhibitions and installations
- Management Consultant at CM-Institute

Dr. Hauke Harder

Lead Developer & Shareholder

State Secretary ret. Dieter Ernst (Supervisory Board Member)

Berlin, Germany

- Assistant to a Member of the Federal Parliament
- District Mayor in Berlin
- State Secretary (Ministry of Economy and Public Utilities), Berlin
- CEO Berlinwasser International
- Strategic Consultant to WILO SE

Dieter Ernst

- Bar Exam in Law

Shareholder

Civilisations Matter Foundation (i.f.)

non-profit foundation

CM-Curators Meeting

Chairman Wolfram R. Bauer
First Managing Director Evelyn Rehm

The charitable foundation will support future projects, which are contributing to the peaceful coexistence of humans on planet Earth, worldwide.

Founders are primarily the founding shareholders of German Clean Water AG. The Civilisations Matter foundation in Berlin is open for international co-founders.

The establishment of a Euro-Asia.Partner Platform, started through CM-Institute (Civilisations Matter), will be integrated into the foundation.

Civilisations Matter Stiftung

EURO-ASIA.PARTNERS

Founder and Chairman Wolfram R. Bauer

2nd Ambassadorial Conference in Berlin

As an informal process of dialogue and cooperation, based on equal partnership and enhancing mutual understanding, Euro-Asia.Partners Platform ”ea” works best to focus directly on projects of common interest.

Civilisations Matter Foundation

Evelyn Rehm (Managing Director)

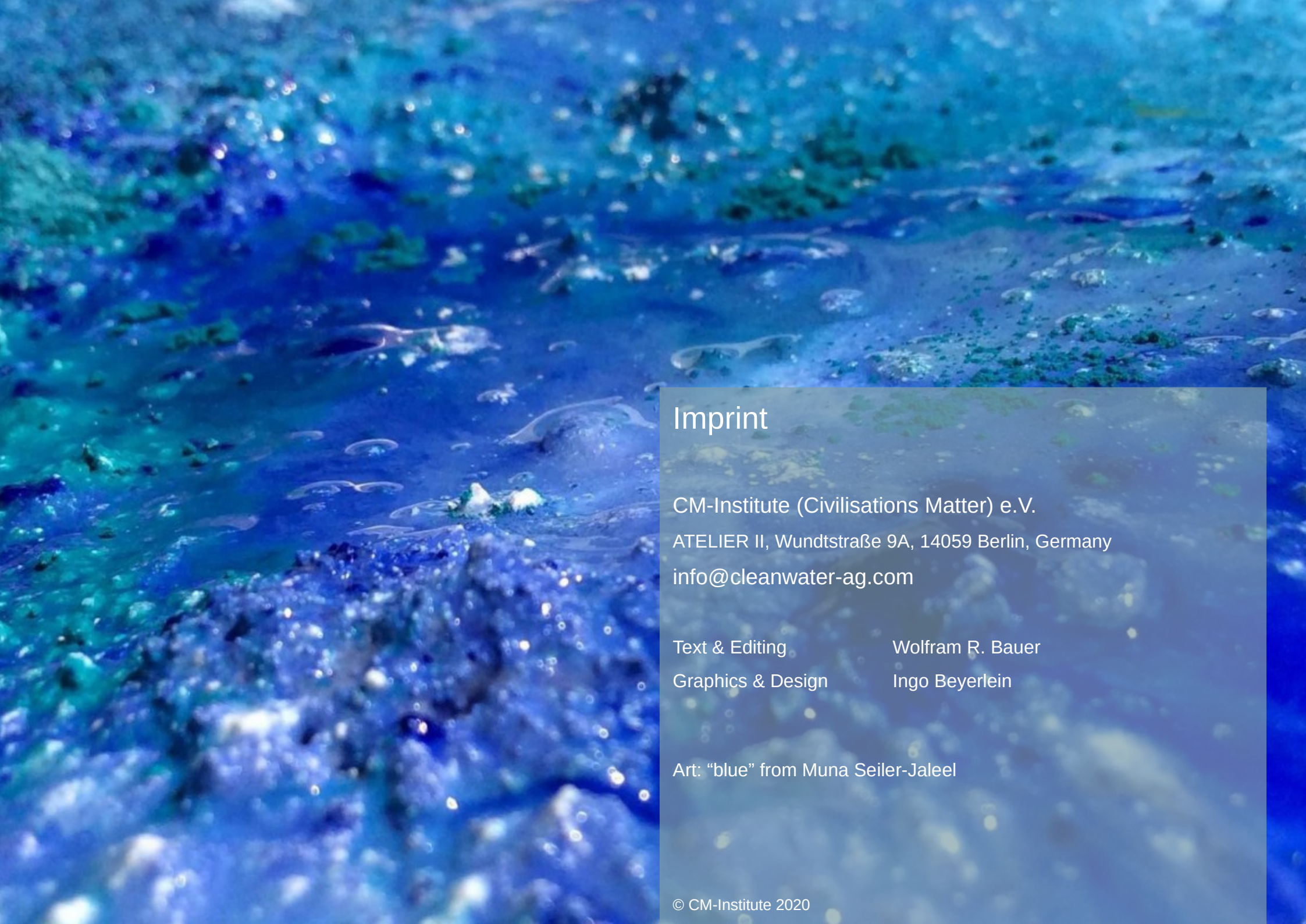
Berlin, Germany

- Membership & Circulation Manager at German Council on Foreign Affairs (DGAP). Responsible for 2.700 members and 50 internationally orientated companies, which are organized in the DGAP Sponsors Association.

  Members of the German Council on Foreign Relations are embassies, associations and individual members from government officials and active and former politicians, including former Chancellors, renowned scholars and business leaders. Eminent media figures including publishers and editors of Germany's leading print publications and prominent TV figures are also among DGAP's members.

Evelyn Rehm

- Free Lance Translator (Public Health) for clients in international organizations such as World Health Organization and various Swiss Universities
- Translator at the Addiction Research Foundation in several projects, Toronto, Canada
- Translator at Addiction Switzerland, Lausanne
- Vocational training in business administration as well as a Masters of Arts degree in communication science



Imprint

CM-Institute (Civilisations Matter) e.V.

ATELIER II, Wundtstraße 9A, 14059 Berlin, Germany

info@cleanwater-ag.com

Text & Editing Wolfram R. Bauer

Graphics & Design Ingo Beyerlein

Art: “blue” from Muna Seiler-Jaleel

© CM-Institute 2020