

1999 Award

Technological innovation, water quality and water access



The theme

For its 1999 prize, the Altran Foundation chose technological innovation in the field of improving access to water and the quality of water around the world as its theme.

The World Bank has estimated that \$700,000 million needs to be invested in water conveyance, purification and irrigation over the next ten years. So far, there is little evidence that any of the measures that have been taken by the various national and international authorities are sufficient to tackle the issue. Water covers 71% of the earth's surface, but is unevenly distributed, and 98% of it is not fit for consumption..

The laureate

Second Prize

Willy VERSTAETE - Belgium

Process designed to remove liquid ammonia

Professor Verstraete's team has developed a reactor, enabling liquid ammonia to be removed from agricultural and industrial water by chemical transformation. By using known bacteria and placing them under particular conditions, a new technology known as OLAND means that a very significant amount of the liquid ammonia contained in the water can be removed from the water with the direct production of nitrogen.

The process is unique insofar as the specific nature of the bacterial environment allows the direct transformation of the liquid ammonia into nitrogen, without having to go through the conventional nitrite/nitrate stages. This highly innovative nitrogen extraction method is an effective means of breaking down compounds that allows the transformation of high liquid ammonia content water into water with a liquid ammonia level that is acceptable for a conventional purification plant.

First Prize

Viviane RENAUDIN - France

Portable and modular sea-water desalination station

The work by Viviane Renaudin and her team, in association with the Nancy-based International Water Centre, has led to the development of a new type of multiple-effect plate evaporator, which can be used for the desalination of brackish or sea water.

The proposed distillation process is based on the principle of multiple-effect dripping film plate evaporators.

This separating technique is unique from both a technological and economic perspective.

From a technological point of view, the elementary evaporation-condensation cells are carefully arranged, making it easy to modify the drinking water production capacity and reuse latent heat from condensation to evaporate the water, thereby saving energy. The innovation lies in the horizontal transfer of vapour to the condensation zone. From a socio-economic point of view, thanks to its human-scale dimensions, its modular construction and its ease of assembly, the system has the advantage of being useable by unskilled operators in developing countries. The process also has political value: it enables a number of countries to end their dependence on their neighbours for their drinking water supplies.

To validate the invention, which is covered by a patent registration, and to optimize the process, a test mock-up consisting of four elementary cells has been built on one of the Centre pilot sites, one of whose teams is a partner in this project. Although the process has so far mainly been used to treat seawater, it can also be used for the desalination of brackish water.

Altran support

The Altran's consultants have participated to:

- The building of a prototype and to solving problems of watertightness;
- Process optimization, performance measurement, theoretical modelling of the project;
- Seeking out financing and partners for its industrialisation. Following their technological assistance, they proved the technical feasibility of the process.

Results

The system produced the first water drop in April 2000

« One year later, we benefited from a financial support of the European Union, within the scope of a project that was associating 7 partners. For me, the Altran Foundation means: projects' accelerators, numerous competences and continuous support. » Viviane RENAUDIN

After the Award

In January 2002, Viviane Renaudin's project was integrated for 3 years into the 5th PCRD (European Framework Programme for Research, Technological Development and Demonstration.), and the Altran Foundation was chosen by the European Commission as a partner. The support of several universities and research groups in Germany, France and Italy allowed a first milestone to be reached in terms of refining the design of the desalination plant. The Italian team worked on the choice of materials for the desalination plant, the German team concentrated on fluid flow, and the French one on the sizing of distribution systems. At the end of this 3 years, an industrial pilot was developed and allowed great performance improvements

- Optimization of points of operation related to output;
- Gross production cost research;
- Marketing research for identification of the project benefits for potential clients.

The jury

President of the jury

Pierre-Frédéric TENIERRE-BUCHOT – France

High Commissioner of the United Nations Environment Programme.

Pierre AMOUYEL – France

General Representative of the ANRT (the National Association of Technical Research).

Jean AUDOUZE – France

Research Director at CNRS and President of the Scientific Committee of the European Innovation & Research Exhibition.

Maurice BERNARD – France

Former Director of Studies at the prestigious Ecole Polytechnique and the Laboratoire de Recherche des Musées de France.

Gunilla BJORKLUND – Sweden

Consultant for the Stockholm International Water institute.

Lucila CANDELA – Spain

Professor at the Catalonia Polytechnic University.

Antonio de CARVALHO QUINTELA – Portugal

Professor at the Lisbon Higher Technical Institute.

Giovanni DAMIANI – Italy

General director of the Italian Bureau for the protection of the environment.

Harald HIESSL – Germany

Director of the Department of Energy and Environment, the Karlsruhe Fraunhofer Institute.

Jens JEDLITSCHKA – Germany

Advisor to the Bavarian Ministry of the Environment.

HRH Prince Laurent of Belgium – Belgium

President of the IRGT (the Royal Institute for the long-term management of natural resources and the promotion of clean technologies).

André LEBEAU – France

Former president of the CNES, France's national space research centre, and of the national Meteorology Office, Météo France.

Victor de LORENZO PROETO – Spain

Researcher at the biotechnology centre of the national scientific research body, Madrid's independent university.

Marie-Odile MONCHICOURT – France

Radio France journalist.

Costantino NURIZZO – Italy

Professor at the Milan Polytechnic Institute.

François OZANNE – France

General director of the Paris' water planning and management company, Société d'aménagement et de gestion des eaux de Paris, SAGEP.

Jacques PICCARD – Switzerland

President of the Swiss Foundation for the study and protection of the seas and lakes.

Yves QUERE – France

International relations representative of the Academie des Sciences.

Raymond SAINT-PAUL – France

Economist, honorary director of the Conservatoire national des arts et métiers

Bruno SCHMOTZ – France

Advisor to the Directorate General DG XII of the European Commission.

Andras SZOLLOSI-NAGY – France

Director of the water science division and secretary of UNESCO's international hydrology programme.

André VAN DER BEKEN – Belgium

Professor of hydrology at the Brussels Free University.

Kenneth WEEKS – United Kingdom

Independent hydrology consultant.

Howard WHEATER – United Kingdom

Professor of civil engineering at Imperial College London.