



THE MILLENNIUM  
TECHNOLOGY  
PRIZE

*Finland's tribute to life-enhancing  
technological innovation*

2008





## Message from the President of the Republic of Finland

TECHNOLOGY plays an inseparable role in our modern lives. Technological innovations have reduced inequality, improved our environment, and accelerated sustainable development.

In meeting the challenges of the future we will need new technologies that are not yet born. New technologies are essential in the search for solutions to global problems such as achieving sustainable energy supplies, the availability of clean water, control of climate change and a number of health-related issues. These solutions touch every one of us.

It is in this spirit that the Millennium Technology Prize is awarded every second year – to inspire and recognize innovations that can provide answers to the challenges of our time, promoting both the quality of human life and sustainable development.

The prize has now been awarded two times. The recipients, Tim Berners-Lee, in 2004, and Shuji Nakamura, in 2006, are excellent crystallizations of the purpose of the award. Their inventions, the World Wide Web and energy-efficient new

light source blue LED, have significant potential for beneficial influence on the lives of billions of people.

Finland is a world-leading high-tech country, where more than one fifth of our national exports consist of high-tech products. Our skills, know-how and standard of living lie in Finland's top-level education, and our exceptional research and innovation systems.

A handwritten signature in cursive script that reads "Tarja Halonen".

**Tarja Halonen**

President of the Republic of Finland

The Millennium Technology Prize is under the patronage of the President of Finland.

*The Millennium Technology Prize  
– Finland's tribute to life-enhancing  
technological innovation*

- *At the one million euro level, the Millennium Technology Prize ranks among the worlds most prestigious awards in its class.*
- *Widely recognised for its emphasis on innovations that promote well-being and sustainable development.*
- *Awarded every second year for a technological innovation that is significantly improving the quality of human life today and in the future.*
- *Awarded by the Millennium Prize Foundation, an independent fund established by Finnish industry and the Finnish state in partnership.*





**Clean water is vital for life.** Water demand already exceeds supply in many parts of the world, and many more areas are expected to experience this imbalance in the near future. Technical progress alone cannot bring clean water to everybody, but its contribution is crucial. The development in water management and purification technologies touch the lives of millions of people all around the world.

# Unique values of the Millennium Technology Prize

The Millennium Technology Prize was established to help steer the course of technological development in a more humane direction and to increase people's awareness of the role that technology plays in the sustainable development of society. The Prize recognises technological achievements that are considered to have a favourable impact on human quality of life and sustainability.

THE MILLENNIUM Technology Prize highlights technological advances with a humanitarian focus. It highlights the work of researchers and application developers in different fields of technology and stimulates both discussion and the exchange of ideas between researchers, enterprises and political decision makers.

The Prize is also intended to be a catalyst for further cutting edge research and to pave the way for the successful introduction of new technologies.

## Quality of life and sustainability as the touchstone

New technology is urgently needed to respond to global challenges including lack of clean water, the

threats posed by climate change and the availability of clean and abundant energy.

As the pace of technical change accelerates, dialogue between technological and humane values becomes increasingly important. Hence the Millennium Technology Prize seeks to promote equality between people, improvement in quality of life, and sustainable development as the core values of all scientific and technological endeavours.

Winner 2004



Tim Berners-Lee's innovation, The World Wide Web, has significantly enhanced people's ability to obtain information central to their lives. It encourages new types of social networks supporting transparency and democracy, and opens up new ways of managing information and businesses.

## Two outstanding winners

The prize was awarded for the second time in September 2006 to Professor *Shuji Nakamura* for developing new, revolutionary sources of light – bright-blue, green and white LEDs and a blue laser. In 2004, the inaugural Millennium Technology Prize was awarded to Professor *Tim Berners-Lee*, who revolutionized electronic communication by inventing the World Wide Web.

### Energy savings, pure water and lighting for the world

Professor Nakamura is widely recognized as the world pioneer in developing light emitters based on the wide-bandgap semiconductor gallium nitride. His prize-winning innovation is a new, solid-state, energy-saving source of light. Professor Nakamura's invention and devices developed using the same principle will have an extensive and positive impact on both quality of life and sustainable development.

LED lights are long-lasting and consume far less energy than normal incandescent lamps. Commenting on the possible consequences of his invention, Professor Nakamura said: “The US Department of Energy estimates over \$98 billion in energy savings could be realized by 2020 if we switch to solid-state lighting. This would also reduce the associated greenhouse gas emissions, and could have a significant effect on reducing global warming.”

Furthermore, compact solid-state LEDs producing ultraviolet light can be used in water sterilization applications, making the purification process cheaper and more efficient. In the communication and information technology sectors, Professor Nakamura’s inventions enhance optical data storage and transfer.

Over the course of time, Professor Nakamura’s LEDs are expected to revolutionize the illumination systems we use as conventional light sources are renewed and replaced. His current research interests include the growing of novel optoelectronic materials and the fabrication of advanced semiconductor devices. Born in Japan, Professor Nakamura is currently working in at the University of California, Santa Barbara.

### The inaugural winner – Tim Berners-Lee

The inaugural Millennium Technology Prize was awarded to Professor Tim Berners-Lee, who revolutionized electronic communication by inventing the World Wide Web. The Web has significantly enhanced our ability to obtain information in a completely new way. It represents huge potential for social exchange whilst also encouraging new types of social networks, supporting both transparency and democracy.

Berners-Lee gave the World Wide Web to the world to use for free. “The decision to make the Web an open system was necessary for it to be universal”, he says. Currently he is leading the World Wide Web Consortium (W3C).



**Shuji Nakamura’s innovation can lead to significant global energy savings by enabling highly efficient illumination systems both in industrialized countries and developing countries. The technology can also be applied to sterilize drinking water more efficiently and economically.**



The Forum Esplanade with Solar Panels in Barcelona (2004)

**Solar energy is free**, abundant and inexhaustible. It is the basic source of all forms of renewable energy: direct solar power and heat, hydro, biomass, wind and wave power. Direct solar power alone that is being harnessed in many parts of the world has the potential to provide many times the current world energy consumption if properly exploited.

# Finding and celebrating the world's best innovators

Candidates for the 2008 Millennium Technology Prize are sought across the world and in all fields of technology. Before the final Winner is selected, the Finalists, their research work and their innovations will be presented to international media and the general public.

THE MILLENNIUM Technology Prize is awarded for a specific, groundbreaking innovation in the field of technology. The winning innovation must be shown to have the potential for a positive impact on quality of life and sustainable development. Important factors in the selection process include the number of people affected by the innovation, and the extent of the changes they may experience.

“We are looking to science and technology and industrial communities all over the world to nominate new candidates. We are searching for the very best innovations and innovators whose work reflects the true spirit of our Prize“, says Dr. Stig Gustavson, Chairman of the Board of the Millennium Prize Foundation.

The nomination period for the Millennium Technology Prize begins on 16<sup>th</sup> April 2007 and ends on 1<sup>st</sup> October.

## Millennium Technology Week

One aim of the Prize is to bring technology closer to people and communicate the importance of technological innovation in the world-wide search for solutions to global challenges. In this spirit, a Millennium Technology Week will be organised in Helsinki starting on 9<sup>th</sup> of June 2008 at which all the Finalists, their research and their innovations will be presented to international media and the general public. The 2008 Winner will be announced, and the Winner and all Finalists will be awarded at the festive Award Ceremony on 11<sup>th</sup> June.

## Members of the 2008 International Selection Committee

The Prize Winner and the Finalists are selected by the Board of the Millennium Prize Foundation on the recommendation of a distinguished International Selection Committee.

### MEMBERS

-  Dr. Marja Makarow, Chairman of the Committee, Finland
-  Dr. Jean-Claude Charpentier, France
-  Dr. Mikko Hupa, Finland
-  Dr. Bob Iannucci, Finland
-  Dr. Risto Nieminen, Finland
-  Dr. Bengt Nordén, Sweden
-  Dr. V. S. Ramamurthy, India
-  Dr. Henry T. Yang, USA

### SECRETARY

-  Dr. Tapio Alvesalo, Secretary General of the Millennium Prize Foundation, Finland

More detailed information and complete nomination guidelines can be found at [www.millenniumprize.fi](http://www.millenniumprize.fi)



**The world's healthcare challenges have no borders.** With new innovations millions of lives can be saved. For example well over 2 million deaths are currently averted through immunization each year. Though, the development of vaccinations must be continuous. New infectious diseases are occurring and at the same time we need to continue looking for efficient vaccination method for the most severe diseases such as Malaria and HIV.

## Funding of the Prize

The Prize is awarded by the Millennium Prize Foundation, an independent fund established by Finnish industry and the Finnish state in partnership.

THE MAIN private organizations providing finance for the Prize are the Centennial Foundation of Technology Industries of Finland and the Confederation of Finnish Industries. One half of the Millennium Prize Foundation's funding is provided by private organisations and corporations, the other half by the Finnish state. At the one million euro level, the Millennium Technology Prize ranks among the worlds most prestigious awards in its class.

The Millennium Technology Prize is a distinctly Finnish award which recognises the fact that Finland has a place in the top rank of the global hi-tech revolution. "The prize is a great opportunity

for Finland to attract more investment, both in research and development and in industry", says Dr. Stig Gustavson, Chairman of the Board of the Millennium Prize Foundation.

"We hope the prize will generate interest among young people and highlight the importance of technology for our future well-being," says Gustavson.

"The Millennium Technology Prize is different from other technology prizes in the sense that it focuses on improving quality of life. In the fields of science and technology, there must also be room for the so-called softer values".

## THE MEMBERS OF THE MILLENNIUM PRIZE FOUNDATION AND THEIR REPRESENTATIVES ON THE BOARD

### **FACTE – Finnish Academies of Technology**

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FACTE is a network of companies and institutes including engineering academies that supports Finnish technology and its international competitiveness by promoting technical sciences, research, education and their state in Finland.

[www.facte.com](http://www.facte.com)

#### CHAIRMAN OF THE BOARD

- **Stig Gustavson** *Dr. Tech. h.c.*

Dr. Gustavson is the Board Chairman of several Finland based industrial corporations and universities

### **Walter Ahlström Foundation**

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Walter Ahlström Foundation awards scholarships for research in the fields of pulp and paper industry, electrical engineering, metal industry and energy economy.

#### VICE CHAIRMAN OF THE BOARD

- **Johan Gullichsen** *Dr. Tech. h.c.*

Professor Emeritus at Helsinki University of Technology

### **Academy of Finland**

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The Academy of Finland provides public funding for high quality scientific research, serves as an expert organisation in science and science policy, and strengthens the position of science and research and promotes the internationalisation of Finnish Research. The academy distributes more than 15 per cent of total government research funding. | [www.aka.fi](http://www.aka.fi)

- **Markku Mattila** *Dr. Tech.*

President of the Academy of Finland

### **EK – Confederation of Finnish Industries**

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EK represents private companies of all sizes in all industries. It aims to create a better and more competitive operating environment for entrepreneurial and corporate activities in Finland. | [www.ek.fi](http://www.ek.fi)

- **Juha Rantanen** *M.Sc. (ECON.), MBA*  
CEO of Outokumpu Oyj

### **Foundation for Finnish Inventions**

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The foundation supports and promotes innovation as well as the development and utilisation of inventions. Its services include advice, evaluation, funding for protection, product development and marketing. | [www.innofin.com](http://www.innofin.com)

- **Juha Jutila** *M.Sc. (Eng.)*

Executive Director for Foundation of Finnish Inventions

### **SITRA – The Finnish Innovation Fund**

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Sitra is an independent public foundation under the supervision of the Finnish Parliament. Through its activities, Sitra aims to promote the economic prosperity and the future success of Finland. Sitra's operations have focused into six programmes: Innovations, Health Care, Food and Nutrition, Environment, Russia and India. | [www.sitra.fi](http://www.sitra.fi)

- **Magnus Sjöblom** *B.Sc. (Econ)*

Director of Financing and Corporate Funding

### **STV – Swedish Academy of Engineering in Finland**

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STV promotes scientific technology research and supports the Finnish industry. STV supports education and research in Swedish, arranging courses and seminars and cooperating with such organizations as FACTE.

- **Jarl-Thure Eriksson** *Dr. Tech.*

Rector of Tampere University of Technology

### **The Federation of Finnish Technology Industries**

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The Federation of Finnish Technology Industries promote the international competitiveness of Finnish technology industries by fostering business development, networking and an innovative business environment. | [www.techind.fi](http://www.techind.fi)

- **Martti Mäenpää** *Dr. Sc. (Tech.)*

Director General of The Federation of Finnish Technology Industries

### **TEK – The Finnish Association of Graduate Engineers**

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TEK is a professional and labour market organisation of graduate engineers, architects and other professionals working in the field of technology. It promotes technology for the benefit of people, the environment and society. | [www.tek.fi](http://www.tek.fi)

- **Pekka Pellinen** *M.Sc.*

Unit Director of The Finnish Association of Graduate Engineers

### **Tekes – Finnish Funding Agency for Technology and Innovation**

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Tekes is the main public funding organisation for research and development and innovation in Finland. Tekes funds industrial projects as well as projects in research organisations, and especially promotes innovative, risk-intensive projects. For its partners, Tekes offers an opportunity to reach the key-players in the field of technology and innovations. [www.tekes.fi](http://www.tekes.fi)

- **Martti af Heurlin** *Dr. Tech.*

Deputy Director General, Tekes

### **TES – Technological Foundation**

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TES promotes technological development in Finland by providing scholarships primarily to young researchers and by recognising individual who have made significant contributions in research and education or otherwise advanced the technology base. [www.kolumbus.fi/tes](http://www.kolumbus.fi/tes)

- **Yrjö Neuvo** *Ph.D., Dr. Tech h.c., Dr. Med. h.c.*

Chairman of the Board of the TES, Technological Foundation

### **TTA – Finnish Academy of Technology**

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TTA fosters technological research and supports the Finnish industry by granting stipends and awards and contributing to FACTE's expert groups, publications and seminars.

- **Matti Pursula** *Dr. Tech.*

Rector of Helsinki University of Technology

SECRETARY GENERAL OF THE FOUNDATION

- **Tapio Alvesalo** *Dr. Tech., Finland*

# Corporate Partners

Cooperation with companies that are engaged in cutting edge technological research and applications widens the Foundation's exposure to new innovations and their impact on society.

## **KEMIRA**

Kemira is a global group of leading chemical businesses with a unique competitive position and a high degree of mutual synergy. Kemira is a chemicals group made up of four business areas: Kemira Pulp&Paper, Kemira Water, Kemira Specialty and Kemira Coatings. Kemira is pursuing superior customer benefits by being a reliable, professional partner whose creative initiatives continuously enhance our customers' products and manufacturing processes.

**kemira**

[www.kemira.com](http://www.kemira.com)

## **NESTE OIL**

Neste Oil is a leading Northern European oil refining and marketing company, with a focus on high quality traffic fuels and other high value-added petroleum products with reduced environmental impact. Neste Oil's strategy is aimed to make the company the world's leading renewable diesel producer.

**NESTE OIL**

[www.nesteoil.com](http://www.nesteoil.com)

## **OUTOKUMPU TECHNOLOGY**

Outokumpu Technology is a worldwide leader in minerals and metals processing technologies, providing innovative and environmentally sound solutions for a wide variety of customer needs in the iron and steel, aluminum and non-ferrous metals industries.

**Outokumpu  
Technology**

[www.outokumputechnology.com](http://www.outokumputechnology.com)

## **NOKIA**

Nokia is a world leader in mobile communications, driving the growth and sustainability of the broader mobility industry. Nokia connects people to each other and the information that matters to them with easy-to-use and innovative products like mobile phones, devices and solutions for imaging, games, media and businesses. Nokia provides equipment, solutions and services for network operators and corporations.

**NOKIA**

[www.nokia.com](http://www.nokia.com)

## **SAVCOR**

The Savcor Group operates in five specialised business areas, offering high technology products, services and solutions for customers in telecom, forest, pulp and paper, infrastructural repair and container logistics industries. With its head office in Mikkeli, Finland, the company has its own operations in 15 countries.

**SAVCOR**

[www.savcor.com](http://www.savcor.com)

# Corporate Partners

## **SEB and SEB GYLLENBERG**

SEB is a leading Northern European banking and financial services group offering high quality services to large and medium-sized corporates and financial institutions. SEB's wholly owned subsidiary SEB Gyllenberg is the leading Finnish asset manager offering services to both institutional investors and private individuals.

**SEB**

**SEB**

GYLLENBERG

[www.seb.fi](http://www.seb.fi) [www.seb.fi/gyllenberg](http://www.seb.fi/gyllenberg)

## **UPM**

UPM is one of the world's leading producers of printing papers. The company's businesses focus on magazine papers, newsprint, fine and speciality papers, converting materials and wood products. The company has production in 15 countries and an extensive sales network throughout the world.



[www.upm-kymmene.com](http://www.upm-kymmene.com)

**SUOMEN KUVALEHTI****Suomen Kuvalehti**

Suomen Kuvalehti is the leading weekly magazine in Finland. It informs readers about the background, causes and consequences of topical events in politics, economy and culture, making it easy to make the difference between trivial and essential. | [www.suomenkuvalehti.fi](http://www.suomenkuvalehti.fi)

**TEKNIKKATALOUS****Tekniikka & Talous**

Tekniikka&Talous is the largest business-to-business weekly in Finland. It features Finnish R&D, technological achievement, people paving the road to high-tech success, case studies about and performance of Finnish industry. | [www.tekniikkatalous.fi](http://www.tekniikkatalous.fi)

**FIM**

**FIM** | Devoted to investing | [www.fim.com](http://www.fim.com)

 **Fortum**

**Fortum** | A leading energy company in the Nordic countries | [www.fortum.fi](http://www.fortum.fi)

 **Gasum**

**Gasum** | Transmission and supply of natural gas in Finland | [www.gasum.fi](http://www.gasum.fi)

**Halton**

**Halton** | Indoor climate solutions | [www.halton.com](http://www.halton.com)

**LÖNNBERG**  
PRINT & PROMO

**Lönnberg Painot** | Printing services | [www.lonnberg.fi](http://www.lonnberg.fi)

 **metso**

**Metso** | Global engineering and technology corporation | [www.metso.com](http://www.metso.com)

**OUTO  
KUMPU**

**Outokumpu** | Stainless steel | [www.outokumpu.com](http://www.outokumpu.com)

 **ORION**

**Orion Corporation** | Innovative pharmaceuticals and diagnostics | [www.orion.fi](http://www.orion.fi)

**SPINVERSE**  
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**Spinverse** | Commercialising nanotechnology | [www.spinverse.com](http://www.spinverse.com)

 **WÄRTSILÄ**

**Wärtsilä** | Lifecycle power solutions to marine and energy industry | [www.wartsila.fi](http://www.wartsila.fi)

# Discover Finland

## Finland is

- world top nation in wired and wireless communication with sophisticated digital and fibre optic voice and data processing networks.
- home to the world's most developed electronic banking system.
- the world leader in forest products, pulp, paper and board technology.
- the world's leading innovator in mobile phones and telecommunications.

## Finland has

- a rapidly growing biotechnology sector.
- enjoyed an extremely successful stock market over the past several years.
- ranked as the least corrupted in the world.
- 20 Universities and 12 research Centres of Excellence.

## Finland's

- international business language is English.
- monetary unit is the Euro.
- five million people live in 131,00 square miles of land – equating to 38 people/ square mile.

Finland is a member of the UN, OECD and WTO.

Finland has been a member of the European Union since 1995.





THE MILLENNIUM  
TECHNOLOGY  
PRIZE

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