Dr. Lorenz Granrath

Personal: born in Grevenbroich, Germany

Education:

1994 **University of Sankt Gallen**, Switzerland

Doctoral Degree (Dr. oec, *topic: Management of Technology*)

1992 – 1993 **The University of Tokyo**, Japan

Visiting Researcher

1990 ***University of Karlsruhe***, *Germany*

Diploma in Industrial Engineering (Dipl.-Wirtschaftsing.)

Professional experience:

since 2001 **Fraunhofer Representative Office Japan**, Tokyo, *Japan*

Representative

1997 – 2001 **GMD - German National Research Center for Information Technology (since 2001 Fraunhofer)**, St. Augustin, Germany

Liason Officer East Asia

1995 – 1997 ***ABB STOTZ KONTAKT GmbH***, *Heidelberg, Germany*

Project manager new technologies, reporting to the CEO

1990 – 1994 **GPS AG, St. Gallen; Balzers AG, Liechtenstein; University of Sankt Gallen**

Consultant / Assistant in the fields of production, strategy and marketing for industrial customers in Germany and Switzerland

Speech Title: Principles of a Sustainable Energy System

Abstract:

The challenges of our current energy system are obvious: dependency on fossil and nuclear energy sources, growing energy prices, climate change due to energy related CO2-emissions and the risk of nuclear disasters. Since they threaten our economy, our goal must be to develop and establish a sustainable energy system. Only an efficient use of energy and renewable energy sources are sustainable. Potential analysis shows that their potential can easily meet the energy demand even of a highly industrialized country like Japan.

Studies and experiences show the main rules of a sustainable energy system based on renewable energy for most countries. Solar and wind will be the main electricity sources due to their potential and costs. All other renewable electricity sources will be used depending on their availability like biomass, geothermal and hydro power. Smart Grids and intelligent energy systems including storage will help to match supply and demand. Solar thermal, biomass, geothermal and heat pumps will be used to generate heat and partly cold. To increase the share of renewable energy sources in the heating and cooling sector, district heating and cooling systems will increase in regions with high density of buildings. This will also allow to run efficient combined heat and power units, e.g. with biogas. Electric vehicles can be integrated in such a system easily. Fraunhofer is developing all components of such systems and is modelling sustainable energy systems on local, regional and national level.