

## **GCRI Interview: Innovation as the Key to Sustainability**

**Professor Dr. Roland Schindler**  
**Executive Director, Fraunhofer Center for Sustainable Energy Systems**

Prof. Dr. Schindler is the Executive Director of the Fraunhofer Center for Sustainable Energy Systems (CSE), a non-profit applied R&D center performing contract research in the fields of photovoltaic (PV) modules and building innovation. Based in Cambridge, Massachusetts, the CSE was founded in 2008 with support from the Massachusetts State Government, National Grid, and Germany's Fraunhofer Gesellschaft. Schindler has been a significant contributor to the PV industry for the last 30 years, and is a world-recognized expert in silicon. He began his career at National Semiconductor in Santa Clara, California, and thereafter, joined Wacker Chemitronic in application engineering and wafer design.

As a 24-year veteran of Freiburg's Fraunhofer Institute for Solar Energy Systems (ISE), Schindler's experience and contact network have been critical both in helping the CSE forge a strong relationship with the Fraunhofer Energy Alliance and ensuring the Center's work stays closely aligned with activities at Fraunhofer ISE. Schindler completed his doctoral thesis at the Max Planck Institute for Metal Research in Stuttgart, and has worked at Cornell, and Stanford University. He received his PhD from the University of Stuttgart.

---

**Q.:** You began your career in the United States, and have been working at Fraunhofer for more than 20 years. What is the role of cultural differences in sustainability awareness in the United States and Germany?

**Prof. Schindler:** From a cultural level, sustainability awareness in Germany is currently at a much higher level than in the United States. However, it is interesting to note that when I first came to the U.S. in the late '70s, in academic circles the opposite was true: U.S. researchers were very conscious of sustainability issues, while the topic did not have much traction in Germany at the time.

**Q.:** In your opinion, what are the main differences in the innovation climate between Germany and the United States?

**Prof. Schindler:** The U.S. has a strong entrepreneurial ecosystem that simply does not have a comparable counterpart in Germany. I would not say that there is more innovation in the U.S. per se – but more innovations become commercialized. This is due to the fact of different financing schemes for start-ups. Also, which is very important, the tolerance towards failure and risk-taking is much higher in the U.S. than in Germany. Both, the

financing schemes and the tolerance towards failing associated with risk-taking make the difference.

**Q.: Do you think sustainability is the key driver of innovation? If so, could you please explain why?**

**Prof. Schindler:** I do have problems bringing the terms sustainability and innovation together. Sustainability is only one of many drivers of innovation. I think, ultimately innovation is driven by the quest for economic advantages, and thus is different from the science approach to further knowledge. Only if it becomes economically viable to adhere to sustainability it will be a driving force for innovation.

One of the reasons the renewable sector is seeing so much investment and development at the moment is simple market forces: companies are responding to growing consumer demand for 'green' products and technologies. The thought that we have to do something for the sake of sustainability certainly is not a substantial driving force.

**Q.: How have Fraunhofer CSE's transatlantic partnerships fostered innovation in the fields of energy efficiency and renewable energies?**

**Prof. Schindler:** As you know, we are still in the start-up phase. However, we are adapting German technology to the U.S. technical and market environment. We are bringing together German innovations and U.S. start-ups, including venture capital, through our TechBridge program. On a higher political level, like DOE<sup>1</sup> or EDA<sup>2</sup>, we develop opportunities for international research in sustainability.

**Q.: Are there lessons you can share with our readers about how they can use sustainability to drive innovation in their organizations?**

**Prof. Schindler:** Sustainability has to do with efficiency and effectiveness – and this not only in using materials, but also in creativity. Do (and achieve) more with less.

---

<sup>1</sup> U.S. Department of Energy

<sup>2</sup> U.S. Economic Development Agency