

Interview: What does the future hold for energy and lighting?

December 28 2012, by Lisa Zyga

(Phys.org)—As 2012 comes to a close, scientists and engineers are looking forward to molding the future, starting with the work they do in their own labs. Phys.org has interviewed a few of today's leading researchers in the areas of energy and lighting, and asked them what they're most excited about in their fields in the years to come.

Dr. David Faiman, Director of Israel's National [Solar Energy](#) Center and Chairman of the Department of Solar Energy & Environmental Physics at Ben-Gurion University of the Negev, specializes in the large-scale provision of electric power from solar energy.

Professor Nadarajah Narendran, Director of Research at the Lighting Research Center at Rensselaer Polytechnic Institute, specializes in optics, optoelectronics, and lighting. His main area of research is solid-state lighting.

Phys.org: To reflect on the past, in your opinion, what has been the most exciting part of your field over the past 10-15 years or so – especially if this is something that most people would not have predicted to be exciting 10-15 years ago?

Narendran: Semiconductor light sources displacing traditional incandescent and gas discharge light sources in lighting applications.

Faiman: First, that concentrator photovoltaics is capable of being cost-competitive with fossil fuel, in sunny parts of the world. Second, that

solar and wind power could be as "cheap" as hospitals, schools and roads, if they were all paid for with our taxes.

Phys.org: What do you predict will be one or some of the most exciting discoveries or advances in your field in the next 10-15 years?

Narendran: Solid-state light sources catering to the dynamic lighting needs of people with very little energy use.

Faiman: I don't make predictions. But the most important area for research is electrical storage – in order to enable the intermittent output from solar and wind generators to be readily available for the needs of the electricity grid.

Phys.org: Where do you see personal electronics going in the next 10-20 years? What kinds of devices might we have, and how will we interact with them?

Narendran: Personal electronics (like smart phones) interacting and controlling appliances within and remote from the space one occupies.

Phys.org: Which alternative energy generation technology (such as solar, concentrated solar, wind, geothermal, etc.) do you think will grow the most in the next 10 or 20 years? Why?

Faiman: I don't make predictions. Generally, they all need to grow. In fact, their respective growth rates will depend upon the whim of politicians, followed by VCs.

Phys.org: Do you think one of these alternative [energy](#) technologies will eventually become dominant to the same extent that oil, coal, and gas are now? Why or why not?

Faiman: Probably, ONLY if the oil, coal, gas industry lets it happen, or if some powerful and independent government (e.g., that of China) makes it happen.

Phys.org: Do you think we will ever become independent of oil, coal, and/or gas? Why or why not?

Faiman: Technically we could. But whether we will depends on a host of political considerations.

Phys.org: Twenty years from now, will most of our cars still be fueled by gasoline? If you think "yes," what about in 50 years? What will be the most difficult part in making this transition?

Faiman: I prefer to focus on what could happen: (1) Electric cars are an exciting potential for the near term, which, as has been amply demonstrated, is a practical possibility; (2) For the longer term, we need to develop liquid hydrogen as an alternative for hydrocarbon fuels. To this end, there are two fundamental scientific problems that must be solved: a physics problem (how to prevent the tiny hydrogen molecules from percolating out through the walls of their containment tank), and a chemistry problem (how to reduce the extreme flammability of this element).

Phys.org: If you don't mind really speculating, what do you think the world will look like 100 years from now, or more? Your thoughts may be influenced by your field of expertise, or may be more generally influenced by your life overall.

Narendran: Lighting playing a much greater role in our daily life, completely changing the way we implement lighting within our built environments and how we [light](#) our spaces with LEDs and OLEDs, and people realizing their value.

Faiman: One hundred years ago, there were two World Wars ahead of us. If we can prevent one more during the next 100 years, Dayenu!

From my field of expertise: it would be nice if our great grandchildren would find it hard to believe that electricity was once generated by burning stuff that they dug out of the ground.

From another part of my life: It would also be nice if the music and reputation of Giacomo Meyerbeer could be restored to where Berlioz, Bizet and Saint Saens placed them, viz, on a par with "Beethoven, Leonardo and Raphael" (Bizet), and not in the pit in which Wagner, Schumann and Mendelssohn ["That jew banker who happens to write music" (Wagner)] successfully buried them during the 20th century.

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