

Keynote Speech for IAC Meeting

It is a great honor to be receiving this award from the DOE, particularly because it is coming from an organization that has been invaluable to my successes in the energy business and to the success of so many of my associates in this field. I think I still have many more years of work to go and I still feel very young, but it was almost 25 years ago that I started at the University of Massachusetts as a graduate student in the Mechanical Engineering program. I had completed my undergraduate studies at SUNY Buffalo a few years earlier, I had worked for a couple of years, and then I decided I had had enough of the day-to-day grind and so hit the road for about a ½ year of travel throughout Europe.

I was enjoying the life of an aimless vagabond, I didn't much like feeling tied down or committed to anything, and my acceptance at UMASS came while I was on the road. I knew the school had some kind of progressive leanings in the energy area and I kind of thought that sounded cool. When I called from Europe and talked to my parents, they told me I had been accepted at UMASS and I just said sign the papers, tell them I'm coming. UMASS might have been offering me some kind of funding or a TA or RA, but those packages never got opened while I was away, and I arrived in Amherst MA a couple of days after arriving home from Europe, just before school started, without much money, without funding, and looking pretty beat up and road weary. Nevertheless, I was the consummate traveler and I had few concerns. Life was meant to be an adventure and grad school was just another step in the process. I'd find some way to get through this school thing and I would have a good time in the process. I guess I felt a little aimless, but without much concern about that. I'd figure something out.

Is all of this true? Pretty much, but I actually wasn't all that aimless. I was carefree and something of a rebel, but I was motivated, and the energy issues of the time and of the years that I was an undergraduate had become passionate ones for me. Unlike many of you, I didn't really get into engineering because of a love of science and technology, but instead because of these passionate concerns about the energy and environmental issues of the day. In fact, I wasn't really that into this engineering field at all, but just thought it might be my path for solving these challenging energy problems. Unfortunately for me, I never really knew that engineering was such a difficult field that required so much work.

I came of age in the early 70's and was an undergraduate from about 1975 to 1980. Those were times of many great issues, and amongst the big ones were the Arab Oil Embargo, gasoline and energy shortages, nuclear energy catastrophes, the start of the still struggling renewable energy industry, and an early awareness of the benefits of energy conservation. Most of you will not remember having to wait in line for gasoline, waiting for half an hour, an hour, perhaps two hours every few days, in lines that could be a few city blocks long, and in cars that all make the current day SUVs look like energy efficient technological innovations. Those energy shortages and rising prices were eye-opening events for many Americans, and the first events that brought energy awareness to the public consciousness.

And there were the big nuclear disasters and the anti-nuclear movement. The Three Mile Island nuclear plant events and, after that, the Russian nuclear disaster in Chernobyl changed the future course of the nuclear industry. The two big nuclear plants of that time that were then under construction, Seabrook in New Hampshire and Shoreham in Long Island NY, were put under incredible scrutiny. Ultimately, Seabrook did open and has been operating successfully for many years, but Shoreham could not hold up under the political pressure,

and construction was terminated well into the process. No other large nuclear plant has opened in the US since that time.

Energy politics, problems, and technologies were in the news, they were hot topics, and I was always glad to hear President Jimmy Carter who was animated in his talks of energy conservation and the environment. I didn't know much about practical engineering but I was motivated by all of these energy issues and for some reason I thought I could do something important, something that would be socially beneficial and politically correct by taking a path in engineering with some focus on energy.

So in September of 1983 I found my cocky, road-weary self at UMASS, knocking on the door of Professor Larry Ambs who had for some reason contacted me and said he might have some funding in a very interesting area. I actually was developing my own ideas of some self-directed program with a focus in energy, so I was dubious, but I thought I would give Dr. Ambs a listen as he described his UMASS Energy Analysis and Diagnostic Center or EADC. (For those of you who don't know, the current day Industrial Assessment Centers or IACs were formerly known as EADCs.) Well, I didn't know who this guy Larry Ambs was and I didn't know much of anything about industry or industrial energy efficiency and audits. But Larry was as animated about energy as anyone I had ever met and he seemed to be able to exude an unbridled and captivating enthusiasm for energy engineering and technologies. And he was offering me money to be part of his team. So I cautiously said yes, that I would join him. I didn't know then that Dr. Ambs would become my mentor and lifelong friend.

Anyway, I became part of this nationwide organization of EADCs, now IACs, and long long after I graduated with my Masters Degree, I have maintained regular involvement with the organization. The IAC organization at the Department of Energy, at Oak Ridge National Laboratory, and mostly at

the key university centers that do an exemplary job of starting engineers on a path towards careers in energy efficiency and energy engineering, have been instrumental in my career and my success. I feel so lucky to have met Larry Ambs, to have been introduced to this vital program, to remain a part of it, and to be its beneficiary as I continue to hire more of its graduates to become part of my team at my company, ERS. And you students who are working on and wrapping up your studies at your various IAC centers ought to take a step back and realize the great fortune you have to be part of a team that can support this early development and future growth of your careers in the energy field. In this regard you are so so lucky, as I have been, to be part of this unique and productive organization.

Let's take a few minutes to step aside and think how the energy issues have changed since that time that I was first observing long lines at filling stations during the major oil embargos, seeing news about Three Mile Island, hearing about the impacts of energy use on the environment, and listening to those fireside chats by Jimmy Carter as he discussed the need for energy conservation. Somewhat different factors are now the critical issues, the key motivators. The public awareness of energy and efficiency and the environment has grown in significance by orders of magnitude since I first entered the field and joined the UMASS EADC.

When I was coming of age there were numerous discussions of fuel shortages and needs for more petroleum resources. There was political instability in the oil-producing world and the US was building the Alaskan Oil Pipeline to secure more petroleum from the resource rich north. And there were discussions of opening up the pristine Alaskan National Wildlife Refuge to oil exploration. That discussion is still continuing and I doubt those political forces that want to make that remote wilderness available for oil exploration will ever succeed. And political stability and challenges certainly continue in the

oil-producing countries. It seems that the struggle to develop more energy sources will not only persist through my career, but through all of yours as well.

In this industry we hear more and more about capacity shortfalls, some of which are presenting real issues today, some anticipated as load grows and as energy supplies and generation systems, and distribution systems, are unable to meet the need. Already we see a new generation of progressive and innovative demand response programs, offered through Independent System Operators, utilities, and state energy efficiency programs, that are attempting to be part of the solution to such onerous problems in an energy hungry society.

And we all know that rates have increased dramatically in the past several years. Nothing changes an energy end user's practices more than painful rate increases. In my practice we've observed this as our large clients seek more support to address their energy problems. One of our clients, for example, a large international corporation that spends \$85 million annually on energy at just one of its facilities, is now ready to spend big on managing this challenging operating cost. We're glad to help them.

Perhaps the biggest driver in the world economy towards energy efficiency is the indisputable scientific information associated with climate change. Scientists and researchers throughout the world have reached consensus and the evidence is clear that this is a real problem. On a regular basis, in the news and in scientific journals, information is released that is concerned with increasing average global temperatures, changing climatic patterns, the shrinking and loss of glaciers that had been present for thousands of years, fissures developing in Greenland's ice fields, large sheets of ice that are breaking off from Antarctica, and the shrinking of the polar ice pack. Most modern nations have joined forces in a global effort to take action and become more energy efficient. Many US states and municipalities are now

also part of the global community and are developing programs that reflect their desire to take action on the climate change issue.

So as we consider such driving factors as environmental concerns and increasing energy rates, we can look at the changing market for energy efficiency, for sustainability, for high performance buildings and cost effective industrial processes that optimize productivity and energy performance. The growth in this industry is unprecedented. States, regulators and various business and non-profit organizations have responded to all of the aforementioned factors with incredible activity. State funding for energy efficiency programs is rapidly growing and private businesses are seeing the wisdom of cost effective investment in premium efficiency and sustainable features for their buildings and plants. The need for new technical staff for the field has never been greater, but I can assure you as a leader in an energy efficiency engineering consulting firm that it is just so difficult to find qualified candidates, to find newcomers to this field. In short, the necessary growth that the energy industry is demanding is being constrained and limited by a shortage in the pool of available talent.

And this brings me back to consideration of our IAC organization. For years, ERS and many other firms have been hiring excellent engineers from the various IAC centers. As the IAC organization has been instrumental in my career and growth, it also has and will be for so many others who are in or will be entering the field of energy engineering. You students who are the leaders of your university IAC centers are so lucky to be part of this organization, and our industry is fortunate to have this wonderful educational and research model as a development ground for new entrants into the field. As energy and environmental problems reach higher and higher levels of significance, an organization like the IAC program is of vital importance to the industry.

But in the world of government politics and poor budgetary prioritization, even such important programs as the IAC have been threatened and challenged. In this market place, in consideration of all of the global problems and needs, budgetary challenges to the IAC program are just unforgivable. The IAC program does not just need to be maintained, but in this time of enhanced need this high value Department of Energy model program must be expanded to better serve the students who enter the industry and to better serve the field for which it is intended. Mechanisms need to be implemented to facilitate better interactions and communications between the IAC and the energy business community.

And the IAC should serve as a model for other energy-focused programs that train graduating engineers in the practical and fundamental aspects of other areas of the energy field and energy engineering in general. I envision programs that move beyond the industrial sector and are focused on commercial and residential sector energy efficiency, cost effective and environmentally friendly power generation, renewable energy, and energy policy. The IAC model works and is a valuable benefit to this industry. In this time of growth and great need, the program must be expanded and we must learn from it as we develop new DOE programs that can benefit the US and world community.

Again, I want to convey that all of you who are students at the IACs are very fortunate to be part of a long-standing program that will help you quickly establish a basis for a successful career in this industry. I do look forward to some of you joining us at ERS, but I'm sure you'll find great success wherever you do end up working. The opportunities now are truly wonderful and you're lucky to be part of this field as it moves aggressively into a period that requires excellence to solve so many unprecedented problems.

And I feel lucky to have long ago made decisions to become part of the energy engineering field. I work with so many wonderful people and there is never a day I don't feel fortunate to be contributing to the development of solutions for key energy problems and challenges. I feel lucky that almost 25 years ago Larry Ambs invited me to become part of his EADC team and that I have been a part of this IAC community for so many years. I am most appreciative to be recognized by the DOE and to receive this award. Thank you all.