Good morning.

I am delighted to be here today at this second annual meeting of the Solid State Energy Conversion Alliance or SECA, as we all know it.

We are convinced that SECA could be one of the most important steps forward in the history of power generation. It could – if you in this audience are successful – be a breakthrough for clean, efficient, and reliable power generation.

It could be the stimulus that will make fuel cells the first choice for "home-grown" power generation or for distributed power for businesses and utilities as well as for military and transportation uses.

I'm convinced that SECA has to be the breakthrough we need. At the projected prices of today's technology -- and we have to be honest about this -- fuel cells will probably never advance beyond niche markets. And I am equally convinced that with the power demands we see coming, it is imperative that fuel cells move beyond today's limited applications. Fuel cells need to be in the mainstream of tomorrow's power industry.

It may surprise some people to know that the solid-oxide fuel cell was one of the earliest power technologies studied in our program. It even pre-dates me. In fact, you can go back to the very first set of projects funded by the Office of Coal Research, back in the early 1960s, and find a project for solid oxide fuel cell development.

The technology has come a long way since those early days. But it remains a challenge – an engineering challenge and certainly an economic challenge.

Yet, at the same time, we see in front of us potential paths to success. We need to work these paths to ensure this technology addresses the growing needs of this country -- environmental needs, fuel efficiency needs, and the special challenges of distributed generation.

We need an innovative concept such as SECA to be successful. It won't be easy.

Why do we need SECA? Well, in case you haven't heard, we have a power problem. It didn't happen overnight, and it won't be solved overnight. But we must solve it.

Supply far exceeded demand during much of the last two decades and many utilities stopped building power plants years ago. The U.S. electric power industry did not foresee a decade of rapid economic growth and the forced retirement of aging and dirty plants.

California is not so much an isolated case – as it is a warning sign for the rest of the nation. The state assumed that this supply excess would continue. It didn't add significantly to its power-plant capacity – not since the mid 1980s. So while restructuring their markets, Californians put too much faith into rosy expectations. And they were ill-equipped when supplies tightened and prices became more volatile.

The rest of the nation cannot be complacent – thinking that California's problems could only happen in California.

In New York City last summer, temperatures were cooler than normal. Yet, wholesale power rates soared 30 percent. New plants are planned, but it will be 2 years or more before they are come on line with sufficient capacity to ease concerns about brownouts and blackouts.

The short-term fix for this coming summer is installation of six turbines within the city limits that run on natural gas. Consolidated Edison spokesman Michael Clendenin said in late February, *"The worst is still ahead for New York, until there's enough power being generated to make deregulation and the free market work."*

So today we need to take a new look at the future of our electrified economy – and recognize that new thinking is required. And new thinking often leads to new technologies.

As I said, the problem didn't appear overnight, and it won't go away in the near future. In 1999, the Energy Information Administration predicted that 300 gigawatts of new capacity would be needed by 2020. Last year, they increased that prediction to almost 400 gigawatts. Now, we are talking about a 44% increase in the nation's demand for power by 2020.

Our demand for NEW power supplies in the next 20 years will be greater than all the power generated today in Germany and Japan, combined.

As I said, we need new thinking – a new vision – about the make-up and character of tomorrow's power grid. For many people -- and I am one of them -- this new vision includes distributed generation and fuel cells.

Distributed generation can reduce dependence on the grid. It provides electricity at remote locations where there are no distribution lines, as well as in areas where the distribution system is too overloaded to allow additional connections. It can alleviate the difficulties with constructing longer distance transmission lines. It provides power when and where it is needed.

Many in the electric power industry are embracing DG. Lawrence Downes, Chairman and CEO of New Jersey Resources, representing the Distributed Power Coalition of America, testified before the Senate Committee on Energy and Natural Resources back in May 2000.

He said:

> **Distributed generation promises to change the electricity industry in much the same way that personal computers changed the face of computing. Personal computers revolutionized our economy, bringing computing power to the desks of tens of millions of Americans. The same future awaits the electric industry. Distributed generation can bring reliability, power quality, cleaner air, and lower costs to all classes of consumers.**

Fuel cells fit hand-in-glove with this new power vision.

***Improved Reliability* -- the digital economy makes this more important than ever. A commercial bank in Omaha, Nebraska, loses power for one hour, and it writes off $6 million. For every hour an airline can't access its central computers, it loses $100,000.**

High quality power on an uninterruptable basis is a critical attribute for our computer-based society. The Electric Power Research Institute estimates that reliability and power quality limitations of the current electricity infrastructure costs the U.S. economy more than $30 billion each year in lost time and revenue.

Fuel cell technologies can provide an onsite solution. Power you can see being generated. Power that is steady, constant, with relatively little distortion. And that makes it ideal for computer-based businesses or hospitals.

Reliability means an awful lot to commercial businesses, but poll after poll shows that even more on the minds of Americans minds is the quality of their environment. The air they breathe, and the air their children will breathe for years to come.

When almost everybody seems to be saying these days, "Not in my backyard," fuel cells are pretty good neighbors. They are clean and quiet -- everything you want neighbors to be.

Fuel cells are so clean that the South Coast Air Quality Control District, which includes Los Angeles, allows them to be sited without a permit.

***Increased Efficiency*: Today, we're hearing more and more about efficiency. California's major rate increase this week was intended, in large part, to encourage the efficient use of electricity. Americans became efficiency conscious in the 70s, wavered a little in the 80s and 90s, and now – at least on the West Coast – are beginning to gain a new awareness of the need to use energy more efficiently.**

I believe Americans also need to be concerned about energy efficiencies at the "front end" of the power cycle in addition to the end-use of energy.

We have enormous opportunities to make improvements in the way we generate electricity – and I would offer to you that every gain we can make in power generating efficiency only compounds the efficiency benefits when the power is used.

Fuel cells take us to a new plateau of front-end efficiency. We break through the 33 or 35 or perhaps in the best of cases, the 38 or 39 percent efficiencies of today's technologies. Now we can set our sights on 60 or 65 percent efficiencies – and if we can capture and use the thermal energy, we're looking at 70, 75 or 80 percent fuel use efficiencies.

If we want to talk about conserving our natural resources, we should be talking about higher power generation efficiencies. If we want to talk about saving costs for consumers, we should be talking about higher power generation efficiencies.

Fuel Diversity **-- Tomorrow's power industry must become a more "fuel diverse" industry – because with diversity comes energy and economic strength. No longer can we say "what should we do for natural gas?" or "what should we do for coal or biomass?" We must ask ourselves "what can we do for ALL our domestic resources? How do we maximize the energy potential of ALL our fuel supplies -- especially those we have in most abundance?"**

And the answer comes back again – fuel cells.

Today, fuel cells are running off of natural gas and landfill gas and a few off of various alcohols. Tomorrow, if our efforts are successful, they could be running off of coal gas, or gas made from biomass, or perhaps municipal waste.

Yes, we have come a long way since the concept of an all solid-state fuel cell was first conceived in the 1960s. Siemens Westinghouse recently completed a record run on a solid oxide fuel cell, accumulating almost 17,000 hours of operation with essentially no performance degradation. That 100-kilowatt unit is the "Energizer Bunny" of fuel cells – it just kept going and going. And I understand the plans are to keep going at a new location.

But despite all of the progress, there is that final hurdle – the one that must be overcome before the PROMISE of fuel cells becomes the REALITY of fuel cells. That hurdle is cost.

If we take a hard look at the last 15 or 20 years, we might have over-promised on our capability to introduce fuel cells are reasonable costs. Three or four thousand dollars an installed kilowatt is too much. A thousand dollars a kilowatt is too much for most applications.

We need to get the costs down to the gas turbine range or below – down to the $400 per kilowatt range.

That is what drives SECA. That is the goal. There is no question, it is ambitious. But cost reductions of this magnitude are not unprecedented.

Look at the electronics industry. Look at computers that cost five and six thousand dollars 15 years ago, now selling for $800 or $900 dollars, with orders of magnitude more power. I saw a VCR on sale a few days ago for $70 – the price of a pair of run-of-the-mill tennis shoes -- the kind that Michael Jordon wouldn't be caught dead in. Who would have imagined that a few years ago?

If mass customization can work for the electronics industry, it can work for its "first cousin" in the energy sector – fuel cells.

That's what we want SECA to set into motion: innovations in mass production that lead to core modules – 5 to 10 kilowatts each – that can be mixed and matched in a variety of combinations.

From the power units of the military to the power generators of our commercial economy....that is what will push fuel cells beyond today's niche markets.

**We won't achieve our goals overnight. We have set aggressive, but achievable targets – $800 a kilowatt by 2005, $600 a kilowatt by 2008, $400 a kilowatt by 2011. **

I am convinced that if we achieve those goals, we will watch fuel cells take off at a pace none of us can imagine today.

Now, let me make my final point: SECA stands for Solid State Energy Conversion Alliance. The key to the technological breakthroughs are the first words "Solid State." But the key to ultimate success is the last word: "Alliance."

That is what will make SECA work. An alliance of skills, and a cross-pollination of ideas. Gone are the days when a single company can carry the load. The risks are too great, the challenges are too numerous. Today, it takes the best and the brightest from industry, R&D organizations, universities, and yes, even government agencies – all applying their expertise toward a common goal.

And there is no goal more important to the economic future of this country than our shared vision of reliable, abundant, low cost, and environmentally acceptable electricity. America runs on the power it generates. America competes on the world market because of the way we generate power. America's future depends on reliable, affordable, clean power. We know that today more than ever.

Thank you for being here. And thank you for your dedication and commitment to this new vision.