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NEWS MEDIA CONTACT:
Bethany Shively, (202) 586-4940

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Remarks as Prepared for U.S. Secretary of Energy Samuel W. Bodman
Grid Week 2008
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Thank you, Guido, for that kind introduction . . . and thank you Kevin for your leadership. You and your team, along with Grid Week's organizing committee and many partners, have done a terrific job putting together this event. I thank you all for being here today.

Last year, those of us participating in the first Grid Week joined together to make the case for a concerted national effort to modernize our electrical grid. We challenged the nation to recognize the scale, scope and critical importance of this effort.

And this year, we move forward to build a broader consensus to develop and deploy smart grid infrastructure for delivering sustainable energy.

You all understand the complexities of this challenge . . . and your participation in this event signals the willingness of a broad range of stakeholders from all regions of the country to join together and move rapidly toward realizing the great potential of smart grid development.

It's fitting that I'm speaking with you today during hurricane season. The recent storms in the Gulf and Southeast have resulted in devastating loss of life and property, and our thoughts are with all those who continue to rebuild and recover.

These hurricanes have also demonstrated, yet again, that our nation's energy infrastructure assets – be it our grid, our production facilities, or our refineries – remain vulnerable to natural disasters. And, I would add, remain targets for those who would do our nation harm.

We have made good progress over the past several years, but the fact remains that we must continue to develop and deploy new technologies *and* improve the physical security of our grid.

As always, I believe it's useful to root our discussion of grid modernization in the context of our overall energy security situation.

You certainly don't need reminding of the energy challenges we face: rapidly growing global demand, high prices, and an urgent need to produce and use energy in ways that do not harm our shared environment – or our security.

With regard to electricity specifically, the Energy Information Administration estimates that in the U.S. total electricity consumption will increase by about 25 percent between now and 2030.

As you know, meeting this demand will require substantial growth of both generating capacity *and* delivery capacity.

Along with increased demand for electricity, we must recognize the need to maintain reliability in the face of growing complexity, transmission congestion, and the already too high costs to our economy from brownouts and blackouts.

And we must continue to confront the fact that our nation has experienced a long period of underinvestment in transmission, distribution, and infrastructure maintenance.

To address all these challenges, we absolutely require a diverse and secure supply of reliable, affordable, clean and sustainable energy. For electricity generation, we will continue to meet demand using a mix of natural gas, coal (especially clean-coal technologies), nuclear power, and hydropower.

But, we also will depend more and more on other renewable energy sources such as wind, solar and geo-thermal.

The EIA's most recent *Annual Energy Outlook* (for 2008) bears this out. It projects that, excluding hydroelectricity, renewable energy consumption for power generation will more than triple between now and 2030.

This assumes significant growth in generation from wind, solar, biomass and geothermal resources.

To be honest, I view these projections to be on the conservative side. And I would argue that the growth in renewable generation must be – and will be – even greater.

Even as we pursue new sources of clean energy and bring them online, we also need more energy efficiency measures throughout our system – in terms of how energy is generated and delivered, but also in terms of how it is used by all Americans and all American businesses.

And, perhaps most significantly for this gathering, we must connect these new sources of sustainable energy to the places that need them most – like densely populated urban centers and high-use industrial facilities.

To do this we need a highly interconnected, reliable, secure, and efficient electric transmission and distribution system. In short, we need to transform this system into a truly *smart* grid.

As you all well know, this requires transformation at all levels – from our transmission infrastructure . . . to substations and feeder lines . . . to metering devices . . . to customer-side appliances and equipment . . . to the very systems and processes we use to manage the grid and price and market electricity.

A smart grid will usher in a new era in electric power for America, an era in which consumers and utilities work more closely together and are enabled by the two-way flow of both power *and* information.

Such a system will improve efficiency and move our nation toward a future comprised of zero-net energy homes, commercial buildings, and communities.

And, it will help us make efficient use of power generation during off-peak hours to fuel emerging vehicle technologies like plug-in electric hybrids.

To bring about such a grid, we must work together to identify barriers and eliminate them. The Department of Energy remains committed to working with you all in such a capacity.

And we believe the best approach is to demonstrate what the smart grid can do, show how it can provide tangible benefits for consumers, and share those lessons widely.

Our Department will continue to aggressively fund research and development in a number of technical areas.

These include: high-temperature superconducting materials and other advanced materials, energy storage devices, modeling and simulation for monitoring and grid management, sensors, communication devices, and information technologies for distributed intelligence throughout the grid.

While government has a major role to play here, we also will continue to partner with you in state and local government, at our utilities, our universities, our national laboratories, and throughout the private sector.

To that end, we are currently engaging stakeholders on the development of a smart grid RD&D plan for the nation.

This engagement will assess gaps, opportunities, and challenges, and develop and prioritize pathways to meet functional requirements. The plan, to be completed in February, will be used to inform the smart grid research and development agenda going forward.

Once achieved, a smart grid will help to fundamentally improve our electric infrastructure. But I also think it's fair to ask if the smart grid in and of itself will be enough.

If we are to truly transform our electric system, then we must come together to answer some key questions about our energy future.

And one critical – but unanswered – question is whether or not we need an interconnected extra high voltage (or "EHV") transmission system.

Just as we've done with the smart grid concept over the last three years, the time has come to aggressively engage this question and to decide on a path forward. Such a system would be a high-capacity inter-regional network of high-voltage [345 kV and higher] transmission lines that would augment but not supplant our existing lower-capacity networks.

To put it simply, it would be the electrical equivalent of the interstate highway system. Today, by comparison, we have some high-voltage lines in some areas, but they are not integrated into a network.

In my view, the benefits of such as system could be extensive and could enhance our nation's energy security and economic well-being.

First off, if we believe that renewable power will continue to play an increasingly large role in our power generation, as I do, then we must confront the problem of linking up large-scale clean-energy facilities with major population centers.

And, in my view, relying on large amounts of remotely-sited generation – whether from wind, solar, geothermal, clean-coal, nuclear or other sources – may not be feasible without building an EHV overlay system.

Secondly, such a system would greatly enhance the reliability and robustness of transmission and has the potential to be considerably more efficient than our current grid – particularly when married with smart grid technologies.

Our nation's fleet of power plants is very diverse already. And that diversity is a *good* thing because it allows operators to adjust to relative changes in price and availability of supply, as well as to adapt to severe weather, maintenance problems and other challenges.

However, this also means that the optimal flow pattern changes constantly. And so, a robust, smart transmission network is essential to operate the fleet in a flexible, reliable and efficient manner under a wide range of conditions.

This is particularly challenging as we consider the new generation capacity that will come online over the next several decades.

There would likely be other benefits as well, including enhanced resiliency and security in the event of a catastrophic, albeit low-probability, event – such as a combination of near-simultaneous failures of key equipment, a major natural disaster, or a terrorist attack.

While the cost of putting an EHV system in place – and making it "smart" – would be substantial, at the end of the day, the relative cost of transmission is still likely to remain a small fraction of electricity's total delivered cost – even into the future.

Today, transmission accounts for between 5 and 10% of the cost of a delivered kWh, providing benefits that greatly outweigh its costs. Looking ahead, regardless of whether or not we pursue an EHV system, our nation *will* make major investments in all parts of our electricity system – generation, transmission, and distribution facilities. And we need to make the right ones.

Accordingly, as we have done with the smart grid concept, we should seriously consider whether an EHV overlay in some form should be integrated into our plans for modernizing the transmission grid.

There are clear benefits of such an overlay, but also a number of uncertainties. For example, major new discoveries of domestic natural gas could lead to an extended period of lower gas prices and make it possible to generate electricity at low cost close to load centers; major advances in photovoltaic technology could make onsite generation much more cost-effective in many areas; and major advances in energy storage technology could combine synergistically with onsite generation.

In short, it's possible to envision some long-term scenarios in which an EHV overlay could turn out to be less advantageous than it appears today. At this point, we just don't know for sure.

And that's why I believe that we must have this national conversation with *all* stakeholders involved, and with full consideration of *all* possible technological advancements.

Among other things, we need to decide how likely certain technological breakthroughs are and w*hen* they might occur . . . what alternatives to building the overlay exist . . . how much such a system is likely to cost and how those costs would be allocated.

No matter what scenario you envision for the future, we will most certainly need more clean energy from remotely located plants, and the transmission capacity to bring the power to market . . . *and* we will require modernization of the electric distribution system and a wide array of end-use energy efficiency strategies.

The best way to ensure a successful energy future for America is to commit ourselves to modernizing the grid, making it smart, and expanding its capacity, flexibility, and functionality.

At the Energy Department, we're working with others on the type of path-breaking analyses necessary to enable this future . . . but there is a lot more work to do. And we need your help.

That's why I felt compelled to raise some of these issues today . . . because we need your leadership if we are to gain a consensus for moving forward.

I also expect that our newly formed Electricity Advisory Committee will weigh in on these issues. The Committee was chartered earlier this year to advise the Energy Department on – among other things – long-range planning and priorities for the modernization of our electricity delivery infrastructure.

It is chaired by Linda Stuntz, a former Deputy Secretary of Energy and long-time DOE champion.

The Committee is currently developing recommendations on a wide range of electricity-related matters, which it plans to deliver in December.

These recommendations will very likely address the topics of grid modernization, smart grid development, energy storage, and the need to expand transmission capacity through an EHV overlay, or other means. However, the details of what it will say are not known at this point.

Given the breadth and complexity of the issues here, there is the possibility for the EAC to follow-up with additional work after its December reports.

The bottom line is this: our collective challenges are many and complex . . . but they can be summed up this way: we must keep the power flowing to all Americans with sufficient reliability and improved efficiency; and we must fully integrate sustainable, renewable power sources into the grid on a major scale across the nation.

Any real solution necessarily requires the involvement of government – at all levels – the private sector, nongovernmental organizations, citizens groups, our university research community, and national laboratories . . . in other words, the very broad group of stakeholders you all represent. Working together, I believe our nation will meet this challenge. Indeed, with your leadership and partnership, we are on our way.

Thank you very much.