



Dupont Summit 2014

..... Science, Technology, and Environmental Policy Issues

December 5, 2014 ♦ Historic Whittemore House, Washington, DC

The Policy Studies Organization

Speaker

Scott Sklar – *The Stella Group*

"Trends in Distributed Generation and Storage as a Multi-Asset Response to Terrorism, CyberSecurity, Increasing Intense Weather Patterns, and Resiliency for Critical Infrastructure and Energy Loads"

Through public policy and a multitude of Department of Defense, and commercial/industrial sector initiatives, on-site distributed generation (much with electric storage) is being scaled in the marketplace.

The UNEP/BNEF report, *Global Trends in Renewable Energy Investment 2013* reported global private sector investments topping \$244 billion (including small hydro-electric projects) 2012 was the second highest year ever for renewable energy investments. There was a continuing upward trend in developing countries, with investments in the South topping \$112 billion versus \$132 billion in developed countries—a dramatic change from 2007, when developed economies invested 2.5 times more in renewables (excluding large hydro) than developing countries. The gap has now closed to just 18%. In terms of power generation capacity, 2012 was another record year with 115 GW of new renewable energy deployments installed worldwide, equivalent to just over half of total net additions.

The September 17, 2013 *Wall Street Journal* article by Rebecca Smith & Cassandra Sweet, "Companies Unplug From the Electric Grid, Delivering a Jolt to Utilities", details the trends in the US, "From big-box retailers to high-tech manufacturers, more companies across the country are producing their own power. Since 2006, the number of electricity-generation units at commercial and industrial sites has more than quadrupled to roughly 40,000 from about 10,000, according to federal statistics. Experts say the trend is gaining momentum, spurred by falling prices for solar panels and natural gas, as well as a fear that power outages caused by major storms will become more common. And some of the companies getting into the business think it is approaching a tipping point called "grid parity," at which point power would be as cheap to make as to buy from a utility. The growing number of companies that are at least partly energy self-sufficient is sending a shudder through the utility industry, threatening its revenues and growth prospects, according to a report earlier this year by the Edison Electric Institute, a trade association for investor-owned electric companies.

http://online.wsj.com/article_email/SB10001424127887324906304579036721930972500-1MyQjAxMTAzMDEwODExNDgyWj.html?mod=wsj_valettop_email

In the USA, SNL Energy's Parth P. Shah reported on April 14, 2014 <http://www.snl.com/InteractiveX/Article.aspx?cid=A-27651127-13356> that the U.S. has 349,858 MW of new capacity in various development phases. The strong push from renewable portfolio standards and federal incentives supports the rise of renewables. As a consequence, the project pipeline is highly skewed toward renewables, which make up 56.58% of the new generation capacity under development.

However, the following challenges with this trend in utilization of distributed technologies are:

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"Trends in Distributed Generation and Storage as a Multi-Asset Response to Terrorism, CyberSecurity, Increasing Intense Weather Patterns, and Resiliency for Critical Infrastructure and Energy Loads" (continued)

1. Our critical functions – infrastructure and critical loads in our buildings are under-served, are vulnerable, are either aged or, if advanced, susceptible to terrorism or cyber-security threats – and the approaches to power them are haphazard, and not planned to address multiple challenges or threats. Primarily, the issue is a lack of interdisciplinary vision and planning as well as a lack of training for multiple treat situations, which are becoming increasingly common.

2. Most on-site solar and wind deployments are either net-metered or utility interconnected, so that when the electric grid goes down, so do they – rather than incorporating smart switching or advanced energy storage for critical functions or feeder lines (distribution).

3. Infrastructure still predominantly relies on diesel back-up power - requiring ongoing costs of testing and diesel fuel change out and repair, rather than dedicated renewable battery systems that have higher reliability and lower operations and maintenance (O&M), particularly for critical electric loads in buildings and within infrastructure and during intense weather events, earthquakes. The fuel required to keep them operating is less likely to be available or deliverable.

Additionally, our infrastructure as well as military facilities are serviced by an aging electric grid, with incoming electric feeder lines at their limits of capacity. Electric power quality (surges, sags and transients) is also severely declining and thus posing higher threats to digital equipment that standard off-the-shelf power quality equipment and offering less protection.

Add to these problems, that weather patterns are becoming more intense. “Each year we have extreme weather, but it’s unusual to have so many extreme events around the world at once,” said Omar Baddour, chief of the data management applications division at the World Meteorological Organization, in Geneva. “The heat wave in Australia; the flooding in the U.K., and most recently the flooding and extensive snowstorm in the Middle East – it’s already a big year in terms of extreme weather calamity... Such events are increasing in intensity as well as frequency,” Mr. Baddour said, “a sign that climate change is not just about rising temperatures, but also about intense, unpleasant, anomalous weather of all kinds.” (*New York Times*, January 10, 2013). Utilization of a portfolio of commercially-available, high-value energy efficiency and renewable energy systems that are autonomous, may be able to strengthen resiliency, address growing cyber-security concerns, and enhance electric power quality – if a more strategic approach is implemented to insure high-quality integration and installation to specifically address multiple concerns.

The presentation will draw upon actual deployed technologies at The Washington Navy Yard and 10 other military and intelligence facilities to draw out the issues and address some of the challenges and opportunities as well as approaches in actual infrastructure deployments along fuel/water/sewage pipelines for pumps, cell towers, and buildings (i.e. hospitals, etc.). We are in a technology transition that offers many added benefits but also some new types of challenges. They can be adequately addressed, but only with a more interdisciplinary approach on technology and the value chain.



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Biography

Scott Sklar - *The Stella Group*

Scott Sklar is an Adjunct Professor at The George Washington University teaching two unique interdisciplinary sustainable energy courses, and an Affiliated Professor with CATIE, an international graduate university in Costa Rica offering graduate degrees on sustainability. Sklar is also part-time Executive Director of the non-profit Center for Small Business and the Environment, and Chairs the Steering Committee of the Sustainable Energy Coalition. In 2012, Acting Secretary Rebecca Blank approved Scott Sklar's appointment as Vice Chairman to the US Department of Commerce Renewable Energy and Energy Efficiency Advisory Committee (RE&EEAC), which will expire in June 2014. Scott Sklar, the Group's founder and president, lives in a solar home and has a zero energy office building in Arlington, Virginia and a unique solar system atop his DC office. His coauthored books: *The Forbidden Fuel* was re-released in 2010 by University of Nebraska Press for its second printing, and *A Consumer Guide to Solar Energy*, was re-released for its third printing.

The Stella Group, Ltd. is a strategic technology optimization and policy firm for clean energy users and companies, with a focus on system standardization, modularity, and web-enabled diagnostics. The company has been blending these new technology solutions for the US Military's net zero energy bases and forward operating bases as well as for State and local governments after Hurricane Katrina and Sandy, as well as Haiti (post earthquake), Sri Lanka (post tsunami) and Philippines (post monsoon). The zero energy building at The Washington Navy yard was just commissioned.