**Main Topic – *Low Voltage Integration***

***Introduction***

During its three year Cal-IRES phase, IRESN organized and conducted multiple research and study efforts on net zero energy topics. It also advocated for greater attention to grid integration issues that arise when buildings and communities rely on solar electricity in “going net zero”. These efforts generated many new insights and pointed to important unanswered questions and the need for quantitative baselines. The insights and a couple sample baselines are captured in a 15-page report that is currently under review by IRESN advisors. It will be available first to IRESN subscribers and supporters who have signed up as such on the [IRESN website](http://www.iresn.org/participate).

***Report Abstract***

Overview of important standards and related metrics that will apply to 21st century electric systems is offered . Content is intended for community leaders and energy professionals. Discussion concerns net energy, i.e. the difference between what is produced and what is consumed. More technically specific definitions are provided. Then, illustrative cases are discussed, including a few preliminary insights from each. Last, the implications of emerging net energy standards and metrics are discussed, and an outlook for integration of local electricity generation in utility distribution grids is offered.

***Net Zero Energy Questions***

The report will address questions, including the following:

* California envisions that all new residential buildings will be net zero after 2020…and all new commercial buildings after 2030.
* What are the practical considerations and outcomes of aiming for net zero?
* How is the term net zero energy defined? Are there alternative definitions and/or related net zero metrics?
* Can existing buildings be retrofitted to consume net zero energy? Do the same technologies, economic considerations and benefits apply? What are the trade-offs between energy production and demand reduction investments?
* California does not yet have a net zero vision for new communities. What are the pros and cons for developing such a vision?
* What about existing communities? Can existing communities be retrofitted to achieve net zero energy? Is there reason and guidance to set net zero energy goals for existing communities?
* Existing buildings vary in both their energy usage and energy production potential. How can net zero energy standards be applied in a way that accounts for the expected and actual variations without limiting energy user economic opportunities or opposing obstacles to cost-effective solutions?
* Will experience with net zero buildings and communities help result in a need to consider arrangements for the exchange of energy between net positive and net negative buildings and communities? What changes will be needed in our energy grids to support the most cost-effective net zero and decentralized energy deployment strategies? What will be the role of community scale “micro” grids in implementing net zero strategies?