**The IRES Network**

*Integrated Resources Enabling Sustainable Communities*

**Introduction**

This newsletter introduces the IRES Network. The IRES Network (IRESN) builds on the foundation laid by Cal-IRES. Future issues will contain articles revisiting Cal-IRES topics as well as articles more focused on integrated resources enabling sustainable communities. As with Cal-IRES, integration is an overarching theme. Likewise, clean and renewable energy; and systems and integration, aka “connecting the dots.”

**Over-arching Purpose**

Energy industries deliver an economically essential suite of products and thus enable the creation of a great deal of wealth. At the same time, when they disrupt local, regional or global ecosystems, they generate poverty. One could argue that in the 20th century, the near term overall economic benefits out-weighed the long term consequences of localized economic dislocation. However, the balance has been shifting in recent decades, and the shift is accelerating as the effects of climate change become more pronounced and manifest. Thus, when we pay for our energy we are creating a mix of wealth and also poverty. As more local and regional economies are undermined, our monetary wealth will not long insulate us from the instability and collapse of economies on which we depend.

The appropriate response to the effects of carbon emissions on climate is *not* business as usual in the energy sector but rather an energy sector that offers low carbon choices. But low carbon choices depend on new technologies and industries combined with the motivation, skills, insight and experience to use their products and services effectively. Good choices depend on reliable information and proven best practices.

New technologies and industries are emerging, and they are necessary. They are also insufficient, if channels to market are blocked by antiquated regulatory structures and obstructionist politics. As the goals of a growing number of communities in California and elsewhere attest, at the grass roots level, there is plenty of motivation for timely climate action.

Skills and experience are still in short supply within communities where the addiction to imported energy commodities has never been a cause for concern. It is this gap that IRESN aspires to address, not single-handedly by any measure, but in community with many other like-minded groups having complementary skill sets and capacity. IRESN will support these groups in a spirit of collaboration and shared service.

**Strategic Gap**

Cal-IRES launched at a time when serious planning and investment in support of high penetration renewable energy deployment in California was gearing up. Impacts on large regional grids are now getting some attention as an artifact of the need to accommodate increasing purchases of renewable electricity by investor-owned utilities. However, the proper long term economic balance between centralized and decentralized deployment paradigms is still a matter of informed conjecture, as are the regulatory adjustments necessary to enable communities to create jobs and wealth through investment in local renewable energy resources. This a strategic gap.

**Connecting Dots**

It’s time to start filling the gap. The IRES Network aims to “connect the dots” in support of more integrated local decision-making. Context is important. IRESN will address:

* Energy **technology** in the context of economics and policy… similarly, economics in the context of technology and policy trends
* Energy **systems** for cities and communities in the context of regional, building and transportation energy system innovation and infrastructure expansion
* Energy **resources** in the context of other critical resources and infrastructure, e.g. land, water, wastewater, waste, and information/ communications
* Energy **supply** in the context of trends in energy finance, delivery, energy demand, user behavior, and information/communications.

**IRESN Energy Vision**

Implementing this vision won’t be easy, and outsourcing core elements of a community’s infrastructure will be a major barrier to cost-effective integration.

Energy supply and delivery systems are subject to a dramatic and potentially rapid market transformation driven by “disruptive” technologies already in play. Smart grid functionality is still at an embryonic stage akin to that of personal computers a couple decades ago. Global on-grid solar PV deployment reached a tipping point within a decade of its beginnings, but local technical and economic integration is still embryonic.

Technically informed scenarios for transformation of regional and global energy infrastructure hinge on the convergence of distributed energy supply and demand assets, and distributed intelligence. This convergence is captured by terms such as “virtual power plant” and the more concrete emergence of functioning micro-grids serving communities where energy security is especially important, e.g. US military bases.

Energy grids of the future will retain current energy transport and delivery capacity but will also increasingly rely on local resources, including increasing automated control of energy functions at the building level. This in turn will enable the creation of local micro-grids and

local energy networks capable of autonomous operation in energy infrastructure emergencies. These micro-grids and networks will ultimately be able to transact energy exchanges to the mutual benefit of their hosts, and tied to a new operating grid system, enable energy sharing.

Using northern California as an example, rural communities rich in biomass, geothermal, and wind energy resources will be able to enter into win-win arrangements enabling urban communities in the region to achieve their energy supply and environmental stewardship goals.