**Main Topic – What is Renewable Integration?**

When we use the term “renewable integration” to describe IRESN’s focus, what do we mean? Integration with what? In what context?

IRESN has been active in certain major dimensions of renewable integration. They are:

* Project integration
* Infrastructure integration
* Money integration
* Societal integration

Without some examples, these terms don’t help much either. So, for example:

***Project integration***

Gene Wilson, a local Davis colleague, stresses the importance of “real projects” He intervenes in projects that require public approval but which fall sort of using clean energy to best advantage. Integration projects can be as simple as arranging for solar PV systems to be installed and “net metered” by local electric utilities. In even simple cases, technical, economic and political aspects need to be integrated or the project will fail. Plus, the projects get started as a result of a vision, personal or shared. So, personal and organizational vision can be an essential integrating factor.

A good example is the new land development project under consideration by the City of Davis. It’s called The Cannery Project. IRESN has been supporting the Valley Climate Action Center’s efforts to make sure net zero principles are applied in shaping the energy packages for the new homes and buildings in the proposed development. The local newspaper has done a good job covering the technical, economic and political issues that need to be integrated for the project is to gain approval.

From a renewable integration perspective, the key question is whether the new project will add to or have a neutral effect on the city’s carbon footprint. This depends on whether the project is viewed holistically vs. one building at a time. Getting to the right answer requires both views… and a lot of others. This is what we mean by project integration.

For example, The Cannery Project specifically requires integration of renewable energy and energy efficiency at the building level, just as the UC Davis West Village project did. Fortunately, Davis Energy Group, the original energy consultant for West Village, has been engaged by the developer and can apply net zero solar community design lessons to scoping energy packages for the Cannery Project buildings.

But that’s the technical part. An economic and policy issue is whether net zero should be a standard feature or an upsell option. This is where full span integration rubber hits the road. Of course there is a political process that parallels the economic number crunching and the technical fact checking. There are endless options, and developer profits are at stake. The city’s climate goals are also at stake, but so are other concessions the city could ask the developer to make. The vision and political aspirations of city council members also matter.

Technical and economic facts become blurred in political processes, and in newspaper reporting as well.

Such projects are laboratories for integration across the technical, economic and political dimensions of local renewable energy. If there is one lesson from The Cannery Project so far, it is that the technical, economic and political dimensions can be more readily integrated if the vision dimension is not a blank sheet of paper. Fortunately, Davis has a climate action plan. Unfortunately, there were no pre-agreed standards for determining if a specific project is aligned with the plan. Lacking standards, an arbitrary and expedient determination is quite feasible. But it might not support the plan.

In Davis, standards are on the way in the form of a draft renewable energy ordinance spearheaded by Gene Wilson, who also chairs the city’s Natural Resources Commission. IRESN supported Gene’s effort. But the proposed standards will only apply after they are adopted by the city council. They would have guided project scoping. Extensive and inconclusive negotiations and related newspaper articles might not have been necessary. This may serve as a lesson for other communities having clean energy deployment or climate action goals.

Here are some links that provide more detail on The Cannery Project and the draft renewable ordinance Davis is considering:

* **Cannery**
  + **Overview:** <http://www.davisenterprise.com/local-news/city/the-cannery-residential-project-enters-the-home-stretch/>
  + **Sustainability Issues:** <http://www.davisenterprise.com/local-news/city/a-sustainability-feature-on-the-cannery/>
  + **Renewable Integration:** <http://www.davisenterprise.com/forum/opinion-columns/the-cannery-can-be-davis-new-green-standard/>
* **Ordinance**
  + **Research Supporting Recommendation:** <http://city-council.cityofdavis.org/Media/CityCouncil/Documents/PDF/CityCouncil/Natural-Resources-Commission/Agendas/20130722/09-New-Construction-Energy-Efficiency-Ordinance.pdf>
  + **Media:** <http://davisvanguard.org/index.php?option=com_content&view=article&id=7505:nrc-puts-forward-renewable-energy-ordinace&Itemid=205&cpage=90>
  + **Text:** <http://www.iresn.org/Resources/Documents/Recommended%20Davis%20Renewable%20Energy%20Ordinance.pdf>

***Other integration dimensions***

We’ll discuss other integration dimensions in future Insights issues. For now, a quick mention of specific examples will have to suffice.

**Infrastructure integration** has many dimensions. Power and natural gas infrastructure are very important to renewable deployment but they also depend on water, transportation, communications and other regional and local infrastructure. It is at the edges of these infrastructure systems that renewable integration examples are easiest to explain and understand. What, for example, are the infrastructure integration implications of solar electricity on home rooftops? Many have come to mind in the process of matching a rooftop solar electricity system to our home’s present and future electricity usage. A single solar home doesn’t create many integration issues, but a community that maximizes its rooftop solar potential will face many more.

**Money integration** is our shorthand for the shifts in capital flows that will be driven by decentralized energy deployment. At the simplest level, financing of decentralized renewable energy supply is a matter of adapting project finance and equipment leasing protocols to solar electricity and other renewable energy applications. The result is that partly integrated projects are possible because financing is still only partly integrated. Fully economically integrated projects are not yet possible. For example, a solar capacity upgrade project for a local church in Davis is dependent on well-conceived but incomplete financing offers that focus, understandably, on solar assets that have quantifiable residual value to their owners.

But what if efficiency investments that complement the solar investment are needed? What if electricity is not the only energy bill and/or only a relatively small part of the energy user’s carbon footprint? How can energy upgrades be financed in a way requires only a single project, technically and economically integrated and financed as a whole, not in pieces? And what happens when real time use of a building’s physical energy assets determines how much the building owner pays and is paid for energy? This is a glimpse of the future of money integration in a renewable energy context.

**Societal integration** implies that a city or county’s energy concerns are not limited to the cost of imported fuel and electricity but rather extend to the preservation and improvement of local economic and ecological vitality. The strongest advocates for local energy empowerment are also the strongest advocates for local “sustainability”, e.g. the Sonoma Climate Protection Campaign, and like-minded groups in other cities and counties.

Municipal and rural utilities are typically focused on quality and cost of service, as are investor owned utilities (IOUs). However, a substantial portion of IOU revenues (i.e. more than 10% of baseline residential rates in northern California) is spent on “public purpose programs”. Ideally, these expenditures would be managed to achieve local as well as broader societal purposes. Are they now? Can they be in a more decentralized energy future?

Putting aside questions of equity and effectiveness, how can collateral societal purposes be met in a future, more decentralized energy economy. A practical, non-academic question facing city councils and publicly owned utility governing boards. What is the right level of funding to set aside for public purposes? What if programs that accelerate deployment of clean energy are at cross purposes with a utility’s primary mission of cost containment and uninterrupted service. How can programs having a long term economic or societal purpose receive adequate management attention and funding in an operating company environment? Can their purposes be cost-efficiently served if no locally chartered energy agency exists to account for unique local problems and opportunities?