

Attachment B-1

SUPPLEMENTAL INFORMATION ON ECONOMICS OF SUSTAINABILITY INITIATIVES

Summary Notes

Milwaukee County's Green Print outlines more than a dozen initiatives intended to improve the County's infrastructure to the long-term benefit of the residents of Milwaukee County. While demonstration of the cost-effectiveness was not a pre-requisite for implementing any given action, economics are typically considered in any improvement project. The following provides some supplemental analysis of the cost-benefit associated with investments in energy-efficient retrofits, renewable energy systems, and alternative fuel vehicles.

Milwaukee County is exhibiting leadership by developing a plan of action and pursuing sustainability goals. From an economic perspective, it is worth noting that 'corporate America' is also pursuing these same goals. Companies who plan for the long-term by and large have embraced the concepts of sustainability and have invested in it. Companies such as Wal-Mart, Miller-Coors, Coca-Cola, Ford Motor, SC Johnson and a long list of others have made strong commitments to sustainability, and most have staff dedicated to addressing their sustainability goals. Many of these corporations are requiring their suppliers to demonstrate their commitment in order to become a supplier to them.

Some examples of how U.S. corporations have adopted sustainable practices include:

- The largest green roof: Ford Motor Company, River Rouge Plant (450,000 sf)
- What may be the largest rooftop solar photovoltaic system (4.8 mega-watt) is under design for the Glimcher Realty Trust for buildings they own in Elizabeth, New Jersey
- AT&T has deployed more than 3,500 alternative fuel vehicles (AFVs), including more than 2,400 compressed natural gas (CNG) vehicles in 543 cities in 35 states. AT&T plans to spend up to \$565 million to deploy approximately 15,000 AFVs through 2018. Jerome Webber, vice president of AT&T Global Fleet Operations noted "Our investment in more fuel efficient vehicles helps minimize our impact on the environment, delivers bottom line benefits to our company and helps to spur job growth in the domestic clean energy sector." [1]

and locally:

- Kohls Department store on South Howell Ave. recently installed LED lighting in its parking lot
- Potawatomi Bingo Casino changed all their parking lot lights to LED lighting and reduced load by nearly 50%, and a projected payback of 4 years [2]

- Coca-Cola Enterprises has retrofitted its bottling facility on Brown Deer Road with energy-efficient lighting products manufactured by Orion Energy Systems of Manitowoc, Wisconsin
- Rockwell Automation recently installed a 48,500 square foot green roof at its global headquarters in Milwaukee

This commitment is further demonstrated by the recent growth in organizations such as the Wisconsin Sustainable Business Council, whose members include Briggs & Stratton, Rockwell Automation, Johnson Controls, Kranz Inc., SC Johnson, Lands End, Green Bay Packaging, Menasha Corp, Kohls Dept stores, and many more.

Historical Trends and Projections in Energy Costs

Until the recent recession, trends in energy consumption and energy prices were both on the rise, both nationally and locally. Since 2000, the cost of a gallon of gasoline has risen over 125%, the cost of a kilowatt of electricity has risen over 40% and the cost of natural gas has been volatile with fluctuations by as much as 400% [3]. Locally, the price of electricity to large customers took a sharp increase (10% in just 2011) due to the sunsetting of the Point Beach nuclear power plant credit [4].

The US Dept of Energy projects that the price of gas, electricity and other fuels will continue to increase at rates between 0.5% and 6.4% annually in the near term [5]. As energy prices continue to rise and revenue sources dwindle, our ability to better manage our facilities through energy conservation and energy efficiency become increasingly important if we are provide an equivalent level of service.

Rationale for Energy-Efficiency Measures

On a national basis, buildings consume approximately 40% of our total energy use. On an annual basis, Milwaukee County spends between \$18 million and \$20 million on utility bills. The efficacy of energy-efficient retrofits is typically measured in terms of 'simple payback' and 'return on investment' (ROI). While both of these measures have their drawbacks in terms of fully accounting for the costs and benefits, they provide a quick-and-simple means of evaluation and comparison. (Other measures, such as life-cycle analysis, can provide a more inclusive assessment, but requires more effort.)

Milwaukee County has been undertaking a significant number of projects that should result in energy savings. Table B-1 presents the simple payback and ROI for a number of projects that are in progress or recently completed. These values were obtained from proposals and contracts from our ESCOs. The table illustrates that the simple paybacks for most energy savings measures are somewhere between 4 to 12 years, with an 8-year

payback being a typical value. This represents a simple ROI of over 12%, which compared to today's rates, many would consider a practical investment.

Beyond the GESPCs, Milwaukee County departments are receiving proposals to make energy savings retrofits, but may not be able to pursue them due to lack of funding sources.

Renewable Energy Systems

The simple payback for renewable energy projects is typically not as good as other ESMs. Therefore, our first priority should be to explore ways to conserve energy before becoming an energy-producer.

The cost of solar energy systems is trending downward, however, and the efficiency of the technologies is on the rise. Figure 1 shows that the installed cost decreased by roughly 33% from 1998 and 2009. If energy prices continue to rise and cost of installing solar continues to decrease, there will come a point in time when solar power is as cost-effective (or perhaps more) an investment as other energy conservation measures. For this reason, we need to closely track the technology and installed costs and pursue small-scale installations in order to become knowledgeable to effectively design, install and operate these systems.

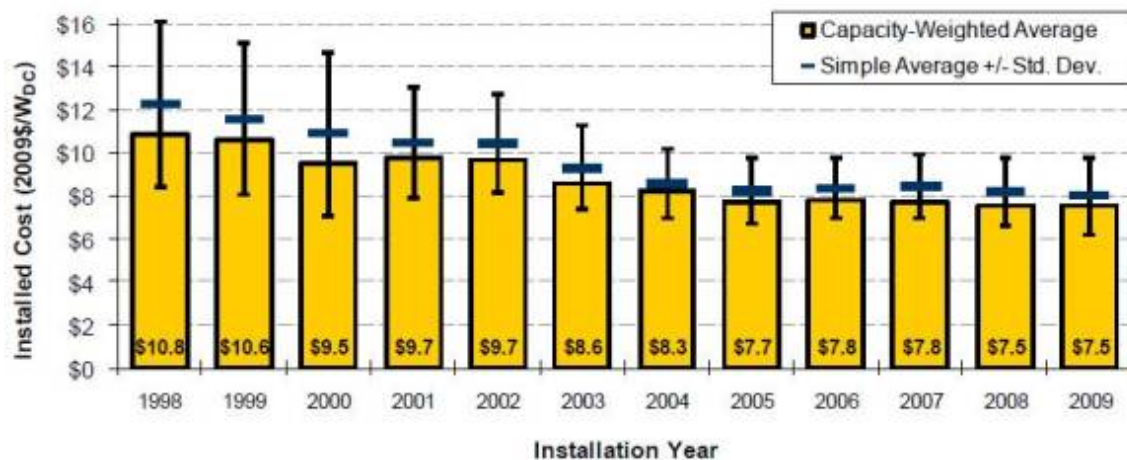


Figure 1: Installed Cost of Solar PV Decreasing Over Time [6]

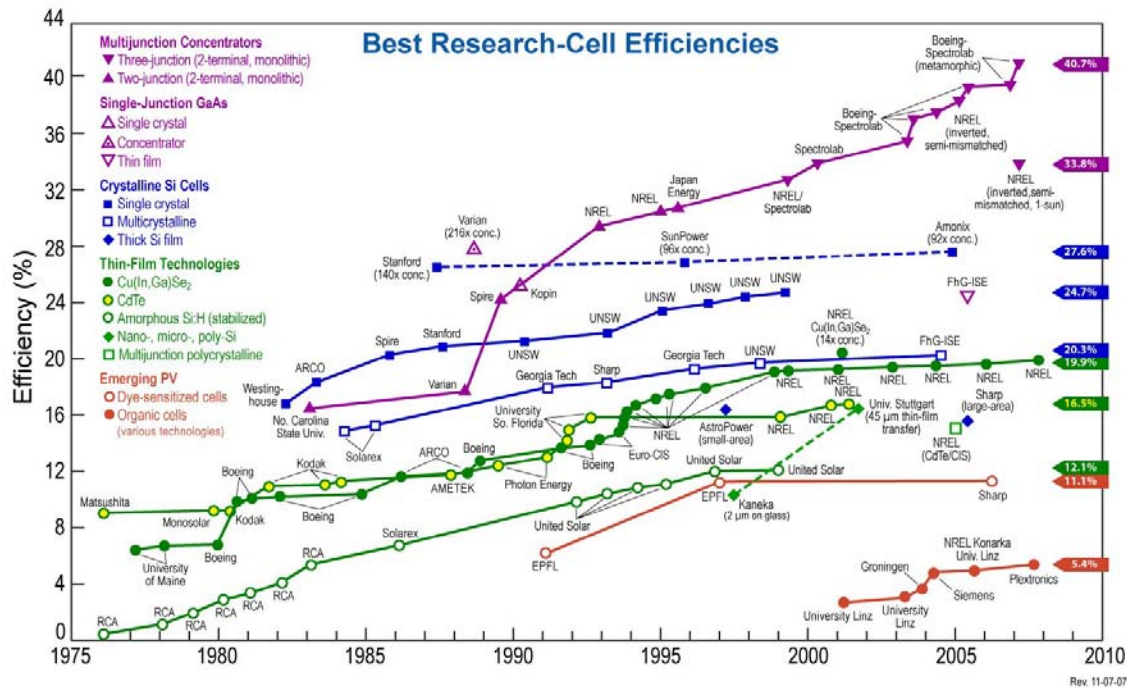


Figure 2: Solar Cell Efficiency Increasing Over Time (NREL)

For the 3.1 kW solar PV system recently installed at Wilson Park, the economics were as follows:

Installed cost:	\$23,175
Rebate from Focus on Energy	- \$5,287
Rebate from WE Energies (projected)	<u>-\$10,000</u>
Net cost, minus incentives:	\$7,888
Projected annual power savings:	~3,720 kWh/year
Annual savings @ 11 cents/kWh:	\$409/year
Simple payback:	19 years *

(*Note that since this was a project funded with EECBG monies, the net cost to the County was \$0; it also assumes no increase in electric rates and is a relatively small-scale project and does not attain economies of scale afforded by larger projects)

Alternative Fuel Vehicles

The following presents an example illustrating the cost-benefit of AFVs

Incremental cost over standard (diesel) shuttle bus: \$15,500
Annual fuel usage: 5,500 gal
Annual fuel cost savings: \$1.75/gal (even better at some locations)
(diesel at \$4.20/gal vs CNG at \$2.45/gal [GGE])
Net annual fuel savings: \$9,625
Simple payback: 1.6 years

The above example applies to the CNG shuttles at GMIA. The simple payback does not account for additional savings from the reduced oil changes typically afforded by CNG-fueled engines, the longer life span of CNG engines, or the reduced air pollution, which benefits Milwaukee County not only in terms of improved human health, but also from a regulatory permitting process.

The following illustrates the cost-benefit of hybrid electric sedans

Sedan incremental cost: \$4,000
Reduced fuel consumption (at 10,000 miles driven): 141 gal
Annual fuel savings (at \$4.10 per gallon): \$577
Simple payback: 6.9 years

References:

1. Wall Street Journal's Market Watch, April 1, 2011
2. JS Online Business, September 11, 2010
3. Henry Hub natural gas monthly average prices, 1999-2009.
4. JS Online Business, December 28, 2010
5. US Energy Information Administration, Short-Term Energy Outlook
6. Tracking The Sun, The Installed Cost of Photovoltaics, Lawrence Berkley National Laboratory, Dec. 2010