The Grand Vision
Energy Network

Plugged In –
How Our Source of Electricity will Shape the Future

The United States at a crossroads

- While two-thirds of the world does not possess reliable electricity, most people in the U.S. are plugged in to a lifestyle heavily dependent on reliable electrical generation.
- Reliable, affordable electricity is assumed by many to be a U.S. birthright. However, this "right" is at a crossroads that holds no guarantee for future generations.
- The ongoing obsolescence of U.S. power plants, rising replacement and retro-fit costs, finite fossil-fuel resources, growing environmental concerns and lagging development of renewable resources are creating a complex and increasingly urgent challenge.

By 2050, the current stable of U.S. power generation plants will be obsolete, while demand is projected to rise 30%.

The four factors that matter

Reliable, accessible electricity requires a balance between the following:

1. *Security:* **The larger the electrical grid and the longer power has to travel before reaching the end user, the more vulnerable the system is to interrupted power.**

   How it affects us:

   - For the majority of its electrical power, Michigan relies on the Eastern Interconnection System – one of three systems comprising the aging U. S. Power Grid. http://www.eia.gov/energy_in_brief/power_grid.cfm

- Two power lines connected to the Eastern System supply 90% of the power to northern Michigan.
- Only 10% of northern Michigan's electricity is generated within 170 miles of its end-use point.
- "Smart Grid" technologies would improve security, but development is costly – estimated in the U.S. at more than $1.5 billion dollars over 20 years. http://www.technologyreview.com/briefing/422119/paying-the-utility-bill/
- Michigan utility companies are beginning to implement smart grid technology. http://www.michigan.gov/mpsc/0,4639,7-159-56137---,00.html
- Municipalities, such as Holland MI, are developing plans for a more independent energy future while innovators at MIT are conducting experiments on small-scale electrical grids that may provide more local power security in the future. http://www.cityofholland.com/planningzoningandhistoricpreservation/holland-community-energy-planning-meeting

2. ***Economic: Production and usage costs must be within acceptable parameters.***

   How it affects us:

   - Michigan's energy costs are consistently ranked among the highest thirty percent in the U.S. http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_5_06_a
   - In excess of $24 billion leaves the state annually to pay for fuel imports –More than twice the amount spent in 2000.

3. ***Environmental: As society dictates more environmentally sensitive power generation, renewable sources face development challenges and traditional sources struggle to adapt to new demands.***

   How it affects us:

   - Electrical generation accounts for 40% of the CO_2 emission in the U.S., with coal generation as the leading contributor. http://www.eia.gov/tools/faqs/faq.cfm?id=77&t=11
   - The federal government requires environmental impact assessment of both current and proposed generation projects. However, reporting generally does not capture all areas of impact, such as health care costs related to production and emissions and the environmental effects of transportation.

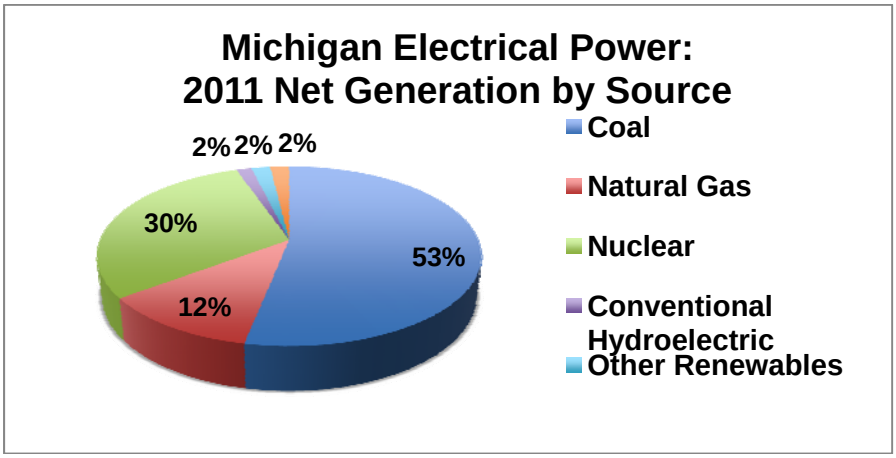
- Efforts are underway at some coal plants to capture CO_2 emissions, but these methods have yet to prove themselves on a large-scale. Further, high-cost retrofit solutions can negate the cost benefit of this resource.

Energy challenges at the local and global levels are complex. Examining the options, plus and minus columns fill up quickly – there is no silver bullet.

4. ***Personal: The sustainability of reliable electrical generation will increasingly be at the hands of the individual, guiding policy and making personal decisions on resource consumption.***
   How it affects us:
   - Options are increasing for residents willing to pay for electricity generated from renewable sources. http://www.michigan.gov/mpsc/0,4639,7-159-16400_17280-276126--,00.html
   - The aging electrical grid, retiring coal plants, development costs for renewable energy sources, and questions regarding methods to access U.S. natural gas reserves, may lead to higher per kilowatt prices for electricity.
   - Conservation is hailed by many as an essential part of both a personal and global energy plan.
   - Lower-income households, especially in rural areas, often rely on expensive propane gas, placing a higher energy cost burden on those who can least afford it.
   - The November 2012 ballot will ask voters to decide if Michigan should change its constitution to require 25% of its electrical generation to come from renewable sources by 2025.

Orchestrating the power portfolio

- Utility companies sell power from a mix of generation sources including – fossil fuels, nuclear, and renewable such as wind. While some generation sources are utility owned, others are purchased and re-sold to their customers. Michigan utilities generally have some ownership stake in generation sources within the state and purchase other sources from outside the state. Three utility companies function as the primary suppliers of electricity to northwest Michigan – Consumers Energy, Cherryland Electric Cooperative and Traverse City Light & Power. Each has its own generation portfolio. Below is the 2011 mix for Michigan:



Source: Energy Information Administration

- Base load electrical generation – used by utilities to supply the minimum daily requirement of electricity – is typically supplied by large coal or nuclear plants. While these "slow but steady" generation giants take time to gear up to full capacity, they provide a constant and predictable source of power.
- Utility companies typically provide peak load generation – electricity that meets the fluctuating demand beyond the base load – through a variety of smaller, more nimble sources that can be geared up or down depending on demand.
- Because renewable sources such as wind and solar provide intermittent power, they present challenges for use as base load power and are typically used for peak load power.

About The Grand Vision:

A comprehensive framework stemming from a six-county land use and transportation study, The Grand Vision reflects the opinions of 12,000 regional residents. The citizen-defined preferred growth scenarios that led to The Grand Vision's guiding principles were unveiled in 2009 as a guideline for growth through the middle of the 21st century. Regional and stakeholder alignment inherent in The Grand Vision framework has garnered state and national attention and served as a catalyst for project funding in excess of $15 million.

Regional Scope:

The following counties are included in The Grand Vision: Antrim, Benzie, Grand Traverse, Kalkaska, Leelanau and Wexford.

Areas of Focus:

The Grand Vision Networks bring together diverse perspectives and expertise with a common focus. The following six networks are built upon elements integral to a sustainable future for the region: Energy, Food and Farming, Growth and Investment, Housing, Natural Resources and Transportation.

About the Energy Network:

Absent from the original land use and transportation study, a sustainable energy platform was later identified by citizens as critical to a regional future in line with The Grand Vision. Participants in the Energy Network – from utility companies to environmental groups – represent diverse perspectives. Together, they raise awareness and facilitate access to information to help achieve sustainable energy solutions.

Additional Resources & Information:

To gain an understanding of issues facing power generation in the U.S., view videos and supplemental information at http://www.beyondthelightswitch.com/, derived from the series produced by Detroit Public Television. The series includes an episode outlining the complexity of meeting demand with the appropriate power generation mix Orchestrating Supply - video @ beyondthelightswitch.com

For extensive information on U.S. energy including state rankings, projections, and generation information, visit the U.S. Energy Information Administration at http://www.eia.gov/

For information on the environmental impact of the various electricity generation technologies, visit http://www.epa.gov/cleanenergy/energy-and-you/affect/index.html

For information on development of smart grid technologies in Michigan, visit http://www.michigan.gov/mpsc/0,4639,7-159-56137---,00.html

For information on power generation in Michigan, visit the Michigan Public Service Commission at http://www.michigan.gov/mpsc

Where will Michigan get its energy in 2030? Contrasting opinions related to the 2012 "Renewable" ballot proposal are featured at http://bridgemi.com/2012/07/where-will-michigan-get-its-energy-in-2030/?utm_source=constant%2Bcontact

For energy related resources within Michigan, visit http://www.michigan.gov/mdcd/0,4611,7-122-25676_25770---,00.html

For information on Michigan electrical power plants, visit http://www.eia.gov/beta/enerdat/#/topic/1?agg=2,0,1&fuel=g&geo=00004&sec=g&freq=A&datecode=2011

For trending of electrical generation sources, visit http://www.eia.gov/electricity/monthly/update/resource_use.cfm