Agenda

1. New Development Ideals
2. Infrastructure Considerations for New Developments– Powerlines, Gas lines, Meters & More
3. Choosing Contractors
4. Building Considerations- Beyond Building Codes
   ◦ Housing
   ◦ Commercial
   ◦ Resorts
IDEAL ADVANCE
ENERGY PLANNING
Important in Advance:

Energy Goals

Energy Planning

Energy Systems
Stats on Energy In Buildings

- According to US EIA, In 2017, about 39% (or about 38 quadrillion British thermal units) of total U.S. energy consumption was consumed by the residential and commercial sectors.

- According to the Environmental and Energy Study Institute, Energy is the number one driver of housing costs.

- According to the Rocky Mountain Institute, Utility costs place a significant financial burden on the 35 million very low- to moderate-income single-family households in the United States. On average, low-income households spend three times as much to heat and cool their homes as the average household—from 20 percent to 50 percent of their monthly earnings in some parts of the country.

- According to US EIA, high performance designed buildings typically use 50-70% less energy.

- Zero Energy Buildings are possible! See https://www.energy.gov/eere/buildings/zero-energy-buildings

- Office buildings in the U.S. spend an annual average of $1.34 per square foot on electricity and 18 cents per square foot on natural gas.

- According to NationalGrid: Energy represents about 19 percent of total expenditures for the typical office building. This clearly makes energy a significant operational cost deserving management attention.
New Development Ideals –
Set and Communicate Goals!

Consider the tribe’s future dreams and visions when establishing long term goals.
Express your sovereignty by putting your environmental and cost of use long-term goals into both your communities and individual buildings.

- Many great (free!) resources are available for advanced energy planning.
- Use local or tribally produced materials.
- Walk the Talk!
- Consider the “health” of the local utility system – May you someday want to remove yourself from that system?
  - Microgrids
  - Local generation
  - Using your own energy resources
  - Create your own local “grid”
- Building long-term energy and water efficiency into community and building design is MUCH cheaper than retrofitting.
- Advanced planning can take advantage of efficient and cost saving design options that are lost after the community or building is completed.
- Low cost commercial energy and water systems can make your businesses more profitable and your homes more affordable and comfortable.
Adopt national or state standards through tribal law – Example:

LEED (Leadership in Energy and Environmental Design) Certifications

- Commercial
- Neighborhood Development
- Homes
- Volume Supplement
- Cities and Communities

- Have an informed application of the chosen standards after Cost/Benefit Analysis!
Examples of Advance Energy (and water) Planning Practices

- Establish a holistic approach with defined high standards.
- **Building Codes** – pros and cons
  - Established Tribal goals such as **Renewable Energy Portfolio Standards**, **Carbon reduction goals**, **Water conservation goals**, and/or **Energy Efficiency goals** AND communicate them!
  - Establish **Tribal Codes** that require both the tribe and non-tribal builders or utility companies to meet established standards or consider various energy options.
- Consider **community location and layout** with renewable energy and infrastructure systems in mind.
- **Project finance** can include renewable energy systems, efficiency elements, infrastructure designed to meet goals.
- **RFPs for contractors** (designers, architects, engineers, construction trade) that stress environmentally friendly systems and include experience in these important areas.
INFRASTRUCTURE CONSIDERATIONS FOR NEW DEVELOPMENTS
Infrastructure planning and development are long-term efforts to incorporate all your current and potential energy resources.
Where on the reservation should you locate your new development?

- Where are the wholesale service substations?
- Where are the wholesale service gas lines?
- What is the capacity at each wholesale service system?
- Do you need a local power source?
- Where are the Solar or Wind resources?
- Where is it best for Geothermal Heat Pumps?
- Water/Sewer
• Metering of Utilities: Where you put your meters, and how many there are will impact how you are charged by the utility. Make this part of the negotiation!

• Know your local utility tariffs.
  • Retail Tariffs
  • Wholesale Tariffs
  • Do those tariffs apply to you?
Infrastructure Considerations for New Developments - Examples

- Tribal Control of Electric Systems – For Future Options
  - Tribal Utility formation #1 – Resort
    Designed with a dedicated substation serving the resort, one master meter and a loop off of which customers can be added.
  - Tribal Utility Formation #2 – No substation, lines which cross through the reservation to serve third parties, no cohesive plan.

- Gas and Utility Meter Placement-
  Facility had 4 meters which allowed utility to charge a higher rate for smaller usage and disqualified facility for wholesale tariff.
Financing Projects

Traditional energy systems have always been included in financing of development.

- Heating and cooling
- Distribution lines
- Gas lines
- Insulation

Why not new types of energy systems?

- Improved insulation
- Solar panels and solar structural enhancements
- Batteries
- Microgrids/controls
- Ground source heat pumps
- Smart meters
CHOOSING CONTRACTORS
Design, Engineering, Architect, Contractor – TEAM APPROACH

Who you hire is an important choice in meeting energy goals

Do they have “green” experience? Are they committed to recycling? Do they have experience with green codes?

Put provisions for efficient building plans in the construction contract.

How will you enforce this?
BUILDING CONSIDERATIONS:
BEYOND BUILDING CODES AND LEED
Culturally Appropriate Building Stock

Use Local Materials and Traditional Knowledge
Design for Efficiency & Renewables

- Passive Solar
- Tree planting for shade
- Geothermal Floor and Building Heat
- Rooftop Solar
- High Efficiency Wood Heating
Geothermal Heating
Large Scale!
Solar Paneled Garage

Include in Design!

Small Scale!
High Efficiency Wood Heat
(and wood delivery program)
Energy Efficient Housing Planning Resources


◦ HUD’s Multifamily Energy and Water Efficiency Library

◦ DOE – Energy Efficient Home Design: https://www.energy.gov/energysaver/design/energy-efficient-home-design

◦ See DOE Article and Webinar: https://www.energy.gov/indianenergy/articles/tribal-housing-authorities-advancing-energy-projects-through-informed
Energy considerations for new housing developments

How Energy Is Used in Homes (2009)*

- Space Heating 42%
- Electronics, Lighting and Other Appliances 30%
- Water Heating 18%
- Refrigeration 5%
- Air Conditioning 6%

* 2009 is the most recent year for which data are available.


◦ Your utilities! They have programs, requirements, standards, and advice.

◦ Development professionals! Engage them early!
Energy Ideas for Large Projects (Casinos, Hotels, Resorts, etc)

- Building heat recovery loops
- Sandia National Labs Report: IDENTIFYING SUSTAINABLE DESIGN OPPORTUNITIES IN TRIBAL HOTELS AND CASINOS: MESCALERO INN OF THE MOUNTAIN GODS HOTEL AND CASINO
- Google “Green Casino”!!

Source: University of Colorado
QUESTIONS?

Margie Schaff 303-443-0182