

Planning for the Future

Energy Management in a Changing World

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Planning for the Future

- The changing world and other drivers for effective planning.
- Comprehensive energy planning.
- Putting the plan together.
- Adapting to change and new issues.

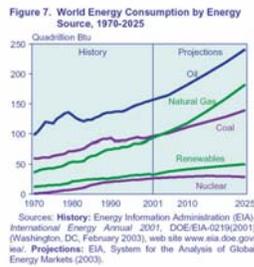
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The Changing World

- Current world energy situation and prognosis.
- EIA projections are interesting but not reality.
- Petroleum and Natural Gas

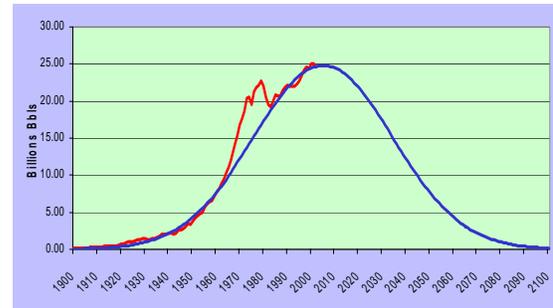


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World Crude Oil Supply up to Present Year

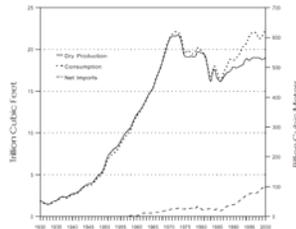


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Domestic Natural Gas Production

- Natural gas is an abundant resource, just not where we have access or pipelines.
- US Natural gas production has plateaued and trending downward.
- We now import to make up for our increases in consumption.
- Price volatility is high and will continue to be so.



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The Changing World

- So what's left:
 - Coal is abundant, but has significant problems.
 - Wind is the fastest growing energy source.
 - PV is next.
 - Efficiency and conservation are the best bet.
- Whatever the future will bring, it is not what we are expecting.

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Other Drivers for Energy Planning

- New Energy Policy Act?
- Energy security – systems and sources.
- Sustainability and productivity issues
- Lack of in-house funds and resources.
- Energy market transformation.
- Energy technology revolution.

Comprehensive approaches required.

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Other Drivers for Energy Planning

- New Energy Policy Act?
 - Significant new goals are coming.
 - New baseline year for Feds.
 - 2 percent per year reduction requirements.
- Energy security – systems and sources.
- Sustainability and productivity issues
- Lack of in-house funds and resources.
- Energy market transformation.
- Energy technology revolution.

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Other Drivers for Energy Planning

- New Energy Policy Act?
- Energy security – systems and sources.
 - Hardening of systems.
 - Ensuring sources:
 - Dual fuel
 - Storage
 - Renewables
 - Efficiency
- Sustainability and productivity issues
- Lack of in-house funds and resources.
- Energy market transformation.
- Energy technology revolution.

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Other Drivers for Energy Planning

- New Energy Policy Act?
- Energy security – systems and sources.
- Sustainability and productivity issues:
 - Sustainability of the built and natural environments is the enduring issue for the 21st century -- Greening of the Government Executive Orders (4)
 - Sustainable development requires a new paradigm for installation planning and land use.
 - Productivity of workers is paramount.
- Lack of in-house funds and resources.
- Energy market transformation.
- Energy technology revolution.

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Other Drivers for Energy Planning

- New Energy Policy Act?
- Energy security – systems and sources.
- Sustainability and productivity issues.
- Lack of in-house funds and resources:
 - Consider all funding sources such as ESPC, UESC, public benefit funds, grants, etc.
 - Truly consider contractors as partners as your success depends on their success.
- Energy market transformation.
- Energy technology revolution.

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Energy Market Transformation

- True competition in electricity will begin in earnest in 4-8 years after deregulation (state dependent) and all this will take longer to play out than expected.
- Once true competition comes, so do changes:
 - Large customers may go with nation-wide contracts.
 - Drop in electrical prices may not be realized.
 - The genie cannot be put back in the bottle – this will continue.
- Change and mergers will continue to dominate.
- Integrated resource planning will return and installations and campuses are a viable market for cogeneration and distributed generation.

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Technology Revolution

- Renewables now competitive:
 - Wind
 - Solar Thermal
 - Geothermal Heat Pumps
 - Micro climate/heat island amelioration
 - Others coming (PV)
- Distributed generation
 - Microturbines
 - Fuel Cells
 - Co- and Tri-generation



A 25 kW Solar-Driven Engine at Salt River Project (AZ) which uses landfill gas to power engine at sundown. June 2003. Courtesy of www.stmpower.com

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Opportunities for the 21st Century

- Enduring issues:
 - Lack of project money and resources.
 - Existing buildings and internal systems.
 - Legacy utilities and central energy plants.
 - Energy security and resources.
- Technology Infusion (what's here, what's coming).
- Sustainability of the built environment:
 - Smart growth
 - Green buildings.



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Comprehensive Energy Planning

- Must take a holistic approach - new security and environmental emphases.
- Must incorporate many options and programs to get the job done (goals, metering, security, technology, privatization, & market transformation).
- Must pick an optimum path without stepping into pitfalls while balancing supply and demand issues.
- Must instill vision and discipline into the energy management process - holistic with overall installation/facility management (master planning, natural resources, heat islands, & new construction).



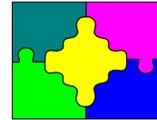
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Planning Process

- 10 year planning horizon.
- Review past efforts and progress.
- Determine current guidance and practices.
- Define goals and desired end state.
- Apply tools and determine technical opportunities based on technologies and analysis models.
- Define fiscal options, economic evaluations, and optimize strategy (outsourcing versus in-house).
- Develop implementation plan and M&V approach.
- Follow-up and periodically revise plan as needed.



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Adapting to New Issues

- Change happens.
- It won't be what we expect and it isn't always pleasant.
- Think of your plan as a set of building blocks that can be rearranged and adapted as new situations and criteria arise:
 - Drop some.
 - Tweak some.
 - Change time frames.



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Final Thoughts

- Measure your progress and periodically assess the plan's reality to the current situation.
- Keep your end-state in mind and reconsider funding and resources each year.
- Plan your energy purchases in increments and work with volume buy organizations such as DESC.
- Always be aware of the bigger picture and how your plan fits into it.

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