



American Association of School Administrators

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Global Energy Markets

Dramatic rise and fall in commodity prices

Energy Markets are inter connected

In recent years the Global Energy Market is impacting our economy

High energy prices drive inflation, squeeze family budgets and the budgets of our education providers



Four reasons energy prices will stay relatively high

1. Emergence of a global middle class
2. Geo Political Pressures, Resource Nationalism
3. New sources are harder to find and produce
4. In the past 20 years, US oil production has declined by 4M barrels per day. Demand has increased by same.



The United States

Largest consumers of energy. We generate 25% of the worlds GDP and consume 25% of worlds energy

We are becoming more efficient, using about half of the energy per unit of GDP compared to 40 years ago

40% Oil

23% Coal

23% Natural Gas

8% Nuclear

7% Renewable (half is hydro power)

Less than one half of one percent wind and solar



The United States

We import two thirds of our oil and 15% of our natural gas, rest of energy, we are self sufficient

Number 1 producer of Nuclear Power and Ethanol

Number 2 producer of coal, natural gas and wind

Number 3 producer of oil

Energy Demand

By 2030 world will need 40% more energy, just based on growing population and rising standards of living

80% of world energy needs will still come from oil, natural gas and coal twenty years from now

Demand in China and India will double by 2025

Increased energy use is a natural consequence of economic growth



Supply

Fossil fuels supply most of the world's energy

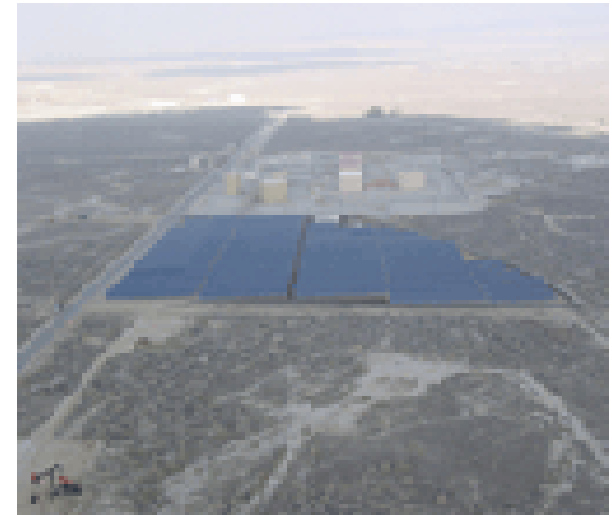
Oil production is in decline in 33 of the 48 largest oil producing countries

OPEC provides about 40% of the world's oil

U.S. spends \$700B per year on imported oil

Where oil and gas are found and in what form will undergo a transformation

Biomass, solar, wind, hydro and geothermal currently contribute 15% of the world's energy supply





Trends

Energy will be one of the defining issues of this century

Energy demand is soaring as never before and driving economic growth

Many of the world's oil and gas fields are maturing. And new energy discoveries are mainly occurring in places where resources are difficult to extract—physically, technically, economically, and politically.

New, renewable sources of energy are promising, but will have a limited impact over the next 20 years.

When growing demand meets tighter supplies, the result is more competition for the same resources

What can we as individuals and facility managers do?



"It's not enough to do your best, you must know what to do, then do your best"

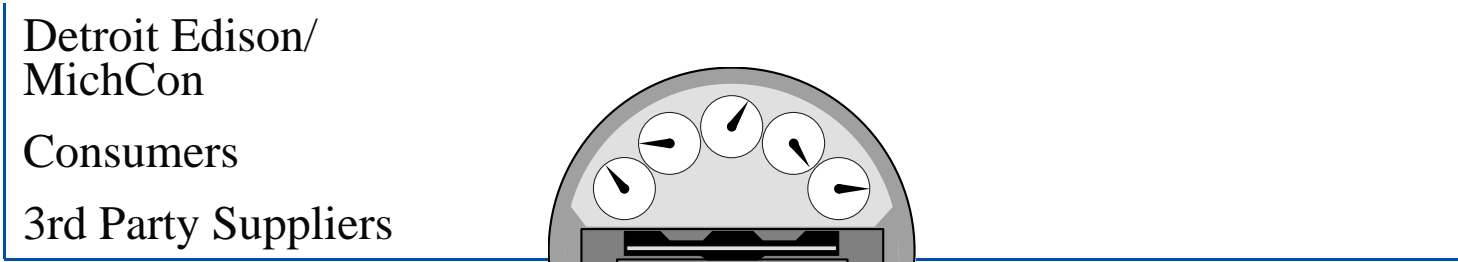
W. Edwards Deming, one of America's most respected business thinkers

"Certainly in the near-term, conservation is the easiest and most reliable "new" energy source there is."

David O'Reilly, President and CEO of Chevron Corporation

Utility

Customer



Supply Side

Demand Side



- Rebates
- Pri/Sec Service
- kWh/KW
- On-Site Generation

- Mechanical Equipment
- Electrical Equipment
- Lighting Systems
- Controls
- Behavior Management
- Training



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Examples of Upgrades - Lighting

Replace magnetic ballasts with electronic and install T-8 lamps

Replace Exit signs with LED technology

Install motion sensors

Replace outside high pressure sodium fixtures with induction lamps



HVAC

Downsized boiler capacity
and replace boilers

Replace obsolete control
systems

Replace steam traps



HVAC

Replace chillers with new high efficient chillers

Install Variable Frequency Drives on cooling tower fan motors

Installed VFDs on existing VAV systems

Replaced AHUs, RTUs and VAV boxes where required





HVAC

Install highly efficient motors where applicable

Install a District-wide Facility Management System

Install a utility monitoring system



Other Upgrades

Install window glazing

Install 4" insulation board (R-15) on block buildings

Replace windows

Install water conservation devices

Separate irrigation system from main water meter

Irrigation system moisture controls



Energy Education

Computer use – Ensure that power management settings are optimized and non-critical computing equipment is shut down at the end of the day.

Lighting unoccupied space – Ensure that lights are shut off during unoccupied times.

Climate Control – Ensure that energy control systems are operated properly and efficiently by staff. Educate staff on the savings achieved by setting back thermostats during unoccupied times. Staff should be encouraged to dress for the season.

Use of table lamps– Educate staff on the use of energy efficient lighting.

District Energy Policies – Make the staff aware that the District does have existing policies, what these policies are, and how these policies will be enforced.



Results

District will save hundreds of thousands of dollars each year in energy expenditures

Reduced maintenance requirements with the replacement of older, maintenance intensive equipment

Improved comfort for building occupants

District Sample Cash Flow Analysis



Financed Amount	\$3,000,000	
Support Services	\$10,000	Per Year
Projected Energy Savings	\$300,000	Per Year
Operational Savings	\$20,000	Per Year
Interest Rate	5.25%	
Inflation Rate	3.0%	

	C1	C2	C3	C4=C2+C3	C5	C6	(C5+C6)-C4
YEAR	INVESTMENT			RETURN		ANNUAL CASH FLOW	
	Principal & Interest	Support Services	Total Annual Costs	Projected Energy Savings	Operational Savings		
1	\$289,396	\$10,000	\$299,396	\$300,000	\$20,000	\$20,604	
2	\$289,396	\$10,300	\$299,696	\$309,000	\$20,600	\$29,904	
3	\$289,396	\$10,609	\$300,005	\$318,270	\$21,218	\$39,483	
4	\$289,396	\$10,927	\$300,323	\$327,818	\$21,855	\$49,349	
5	\$289,396	\$11,255	\$289,396	\$337,653	\$22,510	\$70,767	
6	\$289,396	\$11,593	\$289,396	\$347,782	\$23,185	\$81,572	
7	\$289,396	\$11,941	\$289,396	\$358,216	\$23,881	\$92,701	
8	\$289,396	\$12,299	\$289,396	\$368,962	\$24,597	\$104,164	
9	\$289,396	\$12,668	\$289,396	\$380,031	\$25,335	\$115,970	
10	\$289,396	\$13,048	\$289,396	\$391,432	\$26,095	\$128,131	
11	\$289,396	\$13,439	\$289,396	\$403,175	\$24,791	\$138,570	
12	\$289,396	\$13,842	\$289,396	\$415,270	\$23,551	\$149,425	
13	\$289,396	\$14,258	\$289,396	\$427,728	\$22,374	\$160,706	
14	\$289,396	\$14,685	\$289,396	\$440,560	\$21,255	\$172,419	
15	\$289,396	\$15,126	\$289,396	\$453,777	\$20,192	\$184,573	
totals	\$4,340,940	\$185,989	\$4,382,776	\$5,579,674	\$341,440	\$1,538,338	



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Q & A