

The Changing Paradigm: What's Next for Corporate Energy Efficiency?

Strategic Management Risk, Innovation, Integration

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Today's Superior Energy Management

- High level executive commitment
- Empowered Corporate Energy Leader
- Site Energy Teams
- Goals and accountability
- Accurate current energy data
- Resources planned and allocated
- Measure and communicate
- Constantly raise the bar
- Rewards, recognitions and consequences
- **20% -30% energy productivity advantage**

Created in Stable Energy Markets

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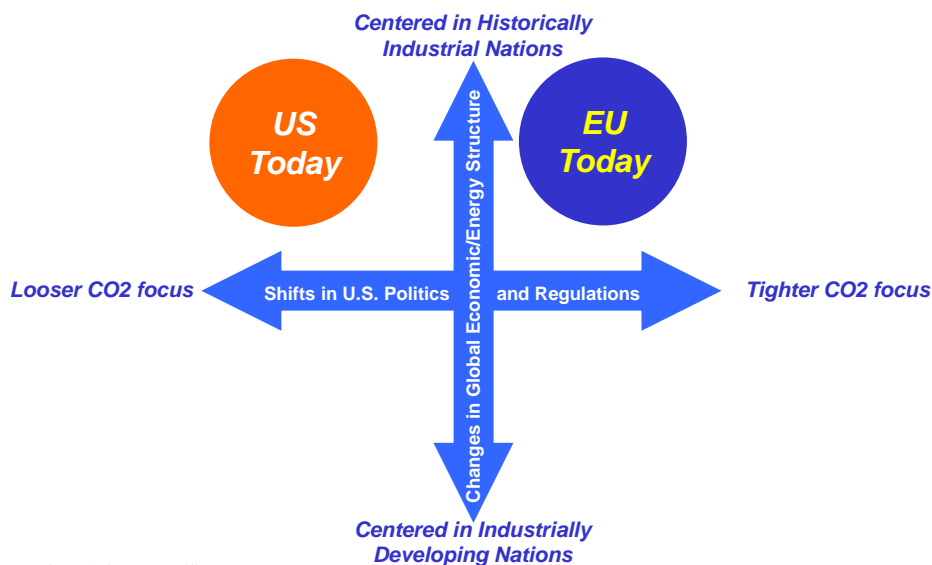
New Global Energy Realities *New Risks – New Opportunities*

- Unpredictable energy prices
 - Sustained volatility and upward trends likely
 - Globalizing prices
- Dependence on imports
 - USA - Oil (70%) and natural gas (16%)
 - EU – more than 50% of all energy
 - China and India major new energy customers
- Climate change legislation
 - Uncertainty over evolution of legislation
 - Uncertainty over compliance costs and requirements
- Underinvested energy infrastructure
 - Grids and networks
 - Traditional fuels
 - Clean and renewable sources
- Wider concern over reliability and environment
 - System stability – Blackouts, quality...
 - Weather events - Hurricanes, tornados, heat storms

Fundamentally different from past

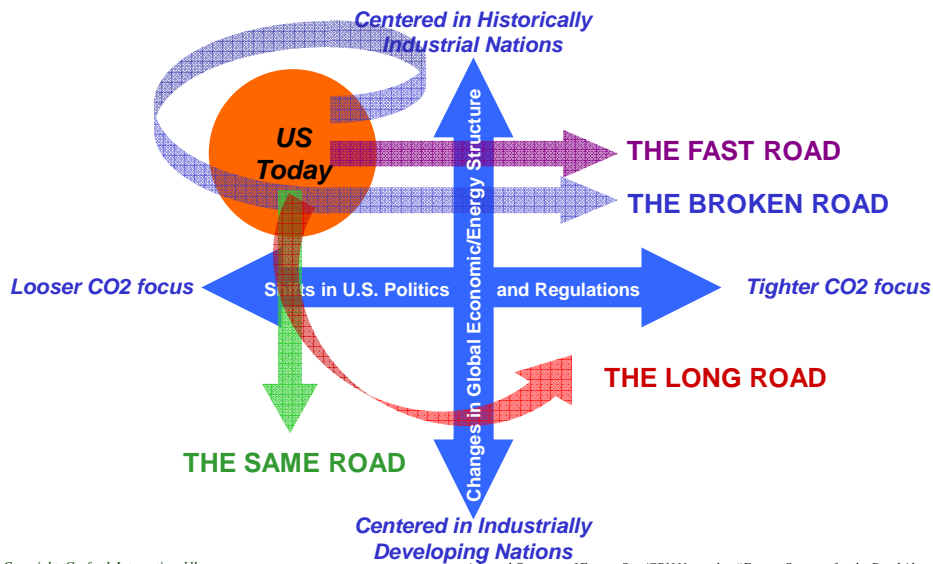
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Carbon Constraints – Economic Balance *What changes in the coming years?*

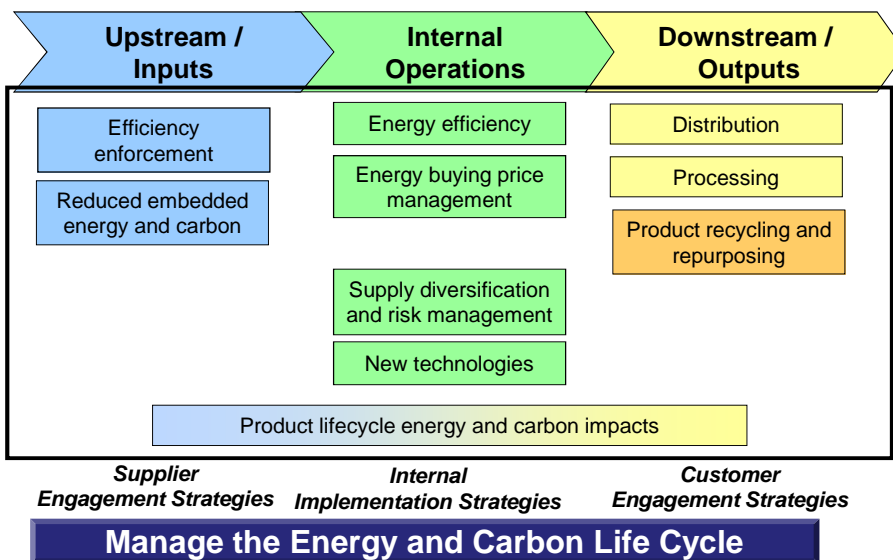


Next Generation Energy Management

Be Ready for "All Possible Roads"



Next Generation Energy Management



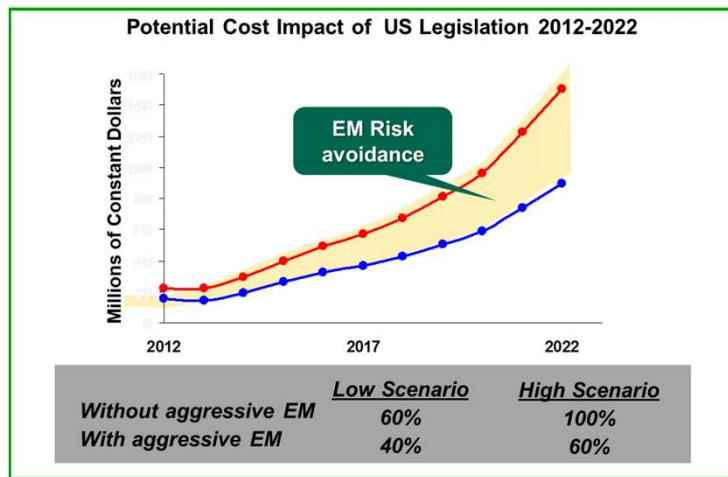
Managing Complexity and Uncertainty Example from Major Global Company

Energy Productivity Action	Complexity	Security Risks	CO ₂ Risk	Cost Risk
Aggressive energy procurement	Green	Red	Red	Green
Energy efficiency of existing process	Green	Red	Yellow	Green
Energy efficiency from new processes	Red	Yellow	Green	Green
Heat Recovery	Yellow	Red	Green	Yellow
Fossil fired cogeneration	Red	Green	Green	Yellow
Biomass/gas fired cogeneration	Red	Green	Green	Yellow
Onsite renewable electricity (wind/PV)	Red	Yellow	Green	Yellow
Onsite renewable heat (solar/biomass/gas)	Red	Green	Green	Green
Green electricity sourcing	Green	Red	Green	Red
GHG Emissions Reductions Trading	Red	Green	Yellow	Yellow
Manage supplier/customer energy/carbon	Red	Yellow	Green	Green

All risks must be valued

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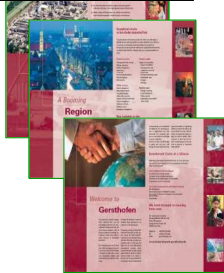
Managing Legislative Uncertainty Example from Major Global Company



Tailor EM Plan to each plant

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Industry-Industry Integration Example from Gersthofen, Bavaria

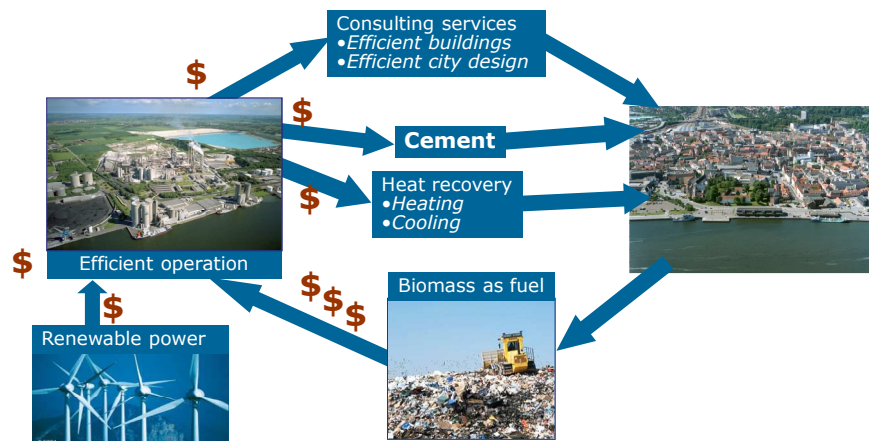


- Shared multi-utilities
 - Heat, steam and cooling
 - Compressed air
 - Water and Waste water
 - Electricity
 - Natural gas
- On-site energy sources
 - Cogeneration and renewables
 - Heat recovery
- Reduced investments
 - Reduced duplication
 - "Right sizing"
 - New technology
- Reduced energy and climate risks
 - Commodity and operating costs
 - Reliability and quality
 - Greenhouse gas emissions
- Reduced risks attracts investors

Effective Operations – Quality Jobs

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Industry - Community Integration Example from Åalborg - Denmark



Reduce Risks – Increase Opportunity

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Next Generation Energy Management
Strategic not a Tactical Issue

- Energy and Climate Risk is Board Level Issue
- Today's Best Practices Energy Management are a "Given"
- Global energy and climate change strategy
- Resilient across a variety of energy futures
- Manage of cost-reliability-environment risks
- Teaming with suppliers and customers
- Teaming with neighbours and community
- New market opportunities driven by energy

Manage Multiple Stakeholder Expectations

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Thank You

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