



Industry/Sector Perspectives in Energy & Competitiveness Food & Agriculture Supply Chain

Energy and climate change issues are extremely critical in all aspects of the food and agriculture supply chain. The basic food and agriculture supply chain is as follows:

- Food & Agriculture Production
- Food Processing
- Logistics & Transportation



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Food & Agriculture (F&A) Production

- Overview: US food safety, security and economics
- Energy costs of production, irrigation, cooling/cold storage, animal productivity, health, feeding and well-being.
- Perspective & Impact Example: California is the world's fifth largest producer of F&A commodities and largest F&A producing state for over 50 years.
- F&A commodity Example & Impact: California dairies (over 20% of US milk production).



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Food & Agriculture (F&A) Production

- Issues of post - 9/11 domestic and overseas import food safety and security.
 - US food supply, and associated energy resources and costs required for domestic production, is a national security issue.
- Climate change and weather patterns are critical to food production (e.g. seasonal production windows, crop yields and quality, hydrology and soil science, etc.).
 - F&A Production Example: Seasonal US tomato production window.
 - Hydrology & Soil Science Example: Increased soil temperature requires increased irrigation acre-footage which impacts water resources and uses.



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Food Processing

- Energy supplies and costs are extremely critical in food processing operations with issues such as:
 - Domestic vs overseas production risk, cost and logistics?
 - Even with energy risk management and hedging, can our company afford the energy to produce food products when during the seasonal production window and/or when the market requires?
- With greater consumer preference for fresh foods, food shelf life, perishability and safety require increased energy requirements in refrigeration. Shelf life and perishability require increased transportation activity from food processing-to-consumer markets.



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Logistics & Transportation

- Food industry logistics and transportation, and associated mobile fuel source requirements and stationary energy sources of refrigeration/cold storage at distribution centers and warehouses, is increasing due to consumer preference of fresh foods.
- Increased food industry logistics and transportation will continue to increase both mobile and stationary sources of CO₂ emissions to meet consumer market demand.



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Summary Points & Thoughts

- The US food industry is heavily regulated with extensive direct and indirect energy resource and cost impacts throughout its forward and reverse supply chain extensions.
- Sustained domestic food production, all aspects including land use, water resources and many other issues in addition to energy and climate change, cannot be taken for granted and needs to be addressed as a national security issue. The US cannot afford to be a net importer of food or be at the mercy of an OPEC cartel equivalent for food production.
- The heavily regulated US food industry has a history of innovation. As many business case studies reference, industries and countries that are heavily regulated are typically the most innovative and competitive.