Pacific Coast Producers

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Tomato Processing and Energy

- The Basics:
  - Tomatoes are approximately 95% water.
  - Our tomato finished products have two primary production processes.
    - Formulated– These products are made by evaporating the water content of the tomato away and concentrating the product. (Sauce, spaghetti sauce, paste etc.)
    - Peeled– We peel these tomatoes and make diced style product lines.
    - Both production models utilize steam and electricity.

Process Flow

- Peeled tomato products are primarily peeled using steam peelers. They are further processed based on product style (diced, stewed, whole etc.).
- Formulated products are run through a variety of processes to evaporate water off the tomato. This is done to concentrate the Brix of the product dependent on product type (paste, puree and juice).
- Canned products are then run through a filler/seamer process to seal the product.
- The final step is a heating/cooling process to ensure food safety.

The Food Energy Concern

- All our processes require steam to function.
- All this steam comes from natural gas fired boilers.
- Why does this matter?
  - Reducing energy usage in steam generation is tough. Steam production techniques have not changed much in the last 50 years. Regardless of fuel type, boilers put pollution in the air. Food production needs steam and thus far tech has not kept up with the sustainability needs of modern food companies. With decarbonization in our future a rapid change is needed.

What has PCP Done?

- Low hanging fruit – Steam trap upgrades, insulation and improved pressure vessels.
- Medium Hanging Fruit - Steam driven turbines
- High Hanging Fruit - New state of the art boilers.
- With these upgrades Pacific Coast Producers reduced our Greenhouse Gas (GHG) emissions by nearly 20% between 2012 and 2019.

Now What?

- Success was followed by questions and an analysis.
  - We replaced a 1972 boiler with a 2017 unit. How much more efficient was it? After the addition of emission controls the new boiler only improved efficiency by about 8%.
  - The remainder of our efforts resulted in significant reductions, but those are now completed and cannot be repeated.
  - What is our next step? Is it possible to decarbonize these processes and still produce food in California?

What is the Answer?

- Problem: Steam is currently the most efficient means of producing food products.
- Food production needs steam and electricity and a lot of both.
- The energy industry has not (yet) produced a technology that can meet our current energy needs (financial and production) and significantly move the needle on efficiency.

Tomatoes and Water

- At the start of this presentation we spoke about what constitutes a tomato.
- 5% solids and 95% water on average.
- In processing a formulated product we evaporate the water off the tomato.
- Where does this water go? It goes to a discharge site. Sustainable? No.
- So the question becomes can we be more sustainable?

YES

- We currently draw water from a well for our production needs. We also evaporate water off tomatoes and discharge it. All this water was being discharged. What did we do?
- We changed. We reconfigured our plant to pull less water from the ground and to reuse more evaporation water wherever possible.
- The results?

Sustainable Water Use

- The average use per day in 2009 was 2.87 MGD
- The average use per day in 2010 was 2.23 MGD
- The average use per day in 2011 was 1.83 MGD
- The average use per day in 2012 was 1.58 MGD
- The average use per day in 2013 was 1.25 MGD
- The average use per day in 2014 was 1.23 MGD
- The average use per day in 2015 was 1.21 MGD

Can Improvement Continue

- Good question?
- We reduced our water usage by over 50%. Since that point we have only had low level incremental improvement.
- Impediments?
  - Cost
  - Technology
  - Need